

# AVIATION WEEK

A MCGRAW-HILL PUBLICATION

JAN. 21, 1952

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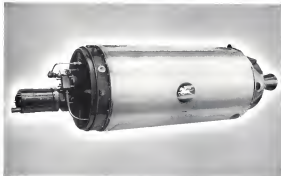


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# Aviation Week

Volume 56

January 21, 1952

Number 3

## Headline News

Defense (Hasty Jet Deal, Plans... 32  
Industry Services, Talk, Plans... 34  
New General, Chevrolet Sign... 36  
Continental Trial at Boston... 38  
Operator Ask New Engine... 37

## Financial

Backlog, No Agreement of... 38

## Aeronautical Engineering

CAN, Study Studies... 36  
New Model, Can Reg... 38

## Aeronautics

AP, New Test, Research... 38  
SND, End Test, Translated... 38

## Production

Vehicle, Road, Barks, From... 37

## Equipment

Aluminum, Packer, Car, Tackle... 38  
Radio, Set, Fly, Set, Fly, Set... 37

## Air Transport

CAN, Airline, Barks, on... 36  
New, Fly, Fly, Fly, Fly... 38  
Mallor, Fly, Fly, Fly, Fly... 38  
10's, Fly, Fly, Fly, Fly... 38  
CAN, Fly, Fly, Fly, Fly... 38  
SND, Fly, Fly, Fly, Fly... 38

## Departments

New Dept... 37  
Aeronautics... 37  
Finance... 37  
Wires... 37  
Industry... 37  
Washington... 37

25 000 copies of this issue printed

Robert H. Wood

Editor

Harold H. Markel

Managing Editor

William Kruger... 37  
Alexander McHenry... 37  
George Riser... 37  
Ben Lee... 37  
G. L. Christian III... 37  
Donald A. Anderson... 37  
P. L. Moore... 37

Advanced... 37  
Flight... 37  
Flight... 37  
Flight... 37  
Flight... 37  
Flight... 37  
Flight... 37

Foreign... 37  
Foreign... 37  
Foreign... 37  
Foreign... 37  
Foreign... 37  
Foreign... 37  
Foreign... 37

Aviation Week is owned by Press-Scimitar, Inc., a subsidiary of Associated Press.

Robert H. Boyer

President

B. W. Martin... 37  
B. W. Martin... 37  
B. W. Martin... 37  
B. W. Martin... 37  
B. W. Martin... 37  
B. W. Martin... 37  
B. W. Martin... 37

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# DO YOU KNOW THESE FAMOUS PLANES?



A. The beginning of the American Air Force is the story of the Wright brothers, who built the first airplane in 1903. The Wright Flyer, a biplane, was the first powered, controlled, heavier-than-air aircraft to achieve sustained flight.

B. A 1913 photograph of the first "biplane" developed by Glenn Curtiss, for which he was awarded the first prize in the Schneider Trophy race.

C. The "Waco" biplane, built by Waco Aircraft Company, was the first biplane to be used in the military. It was used in the First World War.

D. The "Waco" biplane, built by Waco Aircraft Company, was the first biplane to be used in the military. It was used in the First World War.

As the aviation industry unfolded its wings, another major industry was developing with it. The story of new airplane designs and new, better, more powerful engines is paralleled by the development of new, improved airplane fuels and lubricants.

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**Remington Rand.**

## NEWS DIGEST

### DOMESTIC

First Marine XB-31 ground support triple jet bomber has been flown to Edwards AFB, Calif., to undergo additional USAF testing. Plans completed Phase I and II Air Force tests at Marine Airport, Baltimore.

Col. W. J. Wozniak, USAF, has been assigned as liaison between military aviation and Petroleum Administration for Defense on aviation gasoline acquisitions and procurement.

Norfolk Airlines' Convair 240 dropped out of the water just short of LaGuardia Field, N. Y., Jan. 14 while making its approach in poor visibility. There were no fatalities among the 59 passengers and crew of 1.

Arthur Steinmann, general Convair motor and engine manager of Zenith Radio's financing and leasing, died in a New York City car crash on Jan. 8, at the age of 50. In 1951, he was a new member of the giant 12-engine Dornier DOX flying boat when it flew to New York and back to Germany.

Lt. Gen. George F. Stetten, Jr., former Far East Air Force commander, is slated to retire from the USAF Jan. 31 after 36 years of military service. Last May he suffered a heart attack in Tokyo and has been undergoing treatment in Florida.

Three AF generals were nominated to fill the seat left by President Truman last week. They are Lt. Gen. John E. Cassano, Commanding General, TAC; Lt. Gen. Curtis E. LeMay, Commanding General, SAC; Lt. Gen. Benjamin W. Chudney, Commanding General, ADC. The President also nominated Lt. Gen. Lawrence S. Kuter to be Deputy Chief of Staff of Air Force Personnel.

Popular and parts shipments during the first six months of 1951 were valued at \$457 million, with the latter being 75%. Civilian aircraft parts numbered 5,675 valued at \$51 million.

Small Defense Plants Administration has submitted proposal to Defense Dept. which would speed up price differentials in and small business firms in getting government contracts. SDA also asks the Congressional General to rule that sub-contract payments need not be given to the lowest bidder which would permit small businesses to get more contracts.

Clarence M. Keys, aviation pioneer who engaged in numerous phases of the industry, including aircraft and transport, financing of aviation facilities at the age of 75 in New York City Jan. 12, in 1928 he organized the giant South American Airlines Co. which controlled more than a score of aircraft firms.

Suit was filed by Colonel Anthony in United States District Court, N. Y., seeking \$940,000 in damages from Edward Jones, Sr., former Colonel president, Edward Jones, Jr., former vice president, Alfred N. Hobson, former vice president, and Monroe Goodrich, Inc., the airline's advertising agency. Cancellation of a stock option agreement with Jones, Sr., is also sought.

### FINANCIAL

McDonnell Aircraft Corp., St. Louis, Mo., reports a backlog in excess of \$300 million as of Nov. 30, 1951.

Capital Airlines showed a net profit of \$1,721,665 for the first 11 months of last year.

Rohr Aircraft Corp., Chula Vista, Calif., had declared a 12-cent-per-share dividend on common stock payable Jan. 23 to holders of record on Jan. 15.

Mid-Continent Airlines reports a \$7,720 net profit for last November and a net of \$199,916 for the first 11 months of 1951.

Elbert, Inc., Kingston, N. Y., has declared a stock dividend of 4% on outstanding common shares, payable Jan. 30 to holders of record on Jan. 7. Company's backlog is over \$82 million.

### INTERNATIONAL

KLM Royal Dutch Airlines and Garuda Indonesian Airways (operated under contract to KLM) have jointly ordered 14 Conquest Lear 14s. KLM will operate six of the planes in Europe and eight in Indonesia for Garuda. Sale brings total of Convair 140s on order to more than 140.

Aer Lingus DC-5 crashed and burned in Wales Jan. 10, taking all 10 passengers and crew of three. Plane was en route from London to Dublin, but 3,360-ft. Mt. Snowdon during inclement weather.

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**Jan. 17-19**—American Institute of Electrical Engineers, annual general meeting, Hotel Statler, New York.

**Jan. 18**—19th bi-annual of the Astronomical Association, Cleveland Mason Temple, 10th, "Trough in Sea" by T. L. Gault, president of Astronomical Club, New York.

**Jan. 18-19**—International Air Transport Union Technical Committee meeting, Malacca Hotel, Kuala Lumpur, Malaya.

**Jan. 18-19**—AIAA Paper Technical Conference, New York.

**Jan. 18-19**—Institute of the Astronomical Society meeting, Detroit section, presents film on "Tides," The New York University Astrophysical Observatories, and Wright Air Development Center, 58 yrs., Wilsons Hotel, Detroit.

**Jan. 18-19**—11th Annual Meeting of the American Statistical Society, Raritan Hotel, New York.

**Jan. 18-19**—1-20th Annual Meeting of the American Nuclear Society, Raritan Hotel, New York.

**Feb. 7**—Meeting of Society of Automotive Engineers, 19th Society will speak on "Automotive Engineering," New York Hotel, New York.

**Feb. 7-8**—National Institute of Instrument Society of America, Plant Fuel Iron Works, New York.

**Feb. 13-15**—Ann. Internat. Union Conf. Science, with meeting of Ohio Project, mechanical plus 15-15, Indianapolis at Hotel Statler, New York.

**Feb. 14-15**—VIN National Spanish Speaking national meeting, Hollywood Roosevelt Hotel, Los Angeles.

**Mar. 1**—Meeting of Radio Engineers, Waldorf Astoria Hotel & Grand Central Plaza, New York.

**Mar. 1-5**—Spring meeting of American Society of Mechanical Engineers, 19th Congress on testing, metal powders and non-metallic powders, Hotel Statler, New York.

**Mar. 1-5**—National Photo Production Meeting, Institute of the Astronomical Society, Cleveland.

**Mar. 17-18**—Second Midwestern Conference on Plastic Materials to be held at Ohio State University.

**Mar. 17-23**—American Society of Tool Technicians industrial exposition and national conference on "Tooling," Chicago, (see advertisement under Design & Co. 512 Box Building, Detroit).

**Mar. 18-19**—1-Conventions of American Association of Airport Executives, Ft. Worth.

**April 2-24**—National Automatic Meeting and Airmark Engineering Display, Society of Automotive Engineers, Hotel Statler, New York.

[illegible]

**DR CANADA'S NEW OTIFR:** Because of its success with Beaver light transport, DRCanada developed the larger DRK-3 Otter to the Beaver's tune. The Otter has a 680-hp PAW R-1140, seats 14, cruises at 145 mph, and can make 90 vertical takes.



**FORGERS PUT TRAINER**—300-hp only \$34 (left) built above closed, showing its wide, mean cockpit, also listed wing plan. The Rolls Royce Derwent-powered trainer will soon undergo engine tests made by the Dutch Army Air Force. Its 3,600-hp thrust jet engine gives the S44 a top speed of +40 mph at 25,000 ft. It weighs 11,750 lb.



**NEW DANISH LIAISON CRAFT**—The E2 10 (right) is a two-place army helicopter powered by a 145-hp Continental built by Skovsmønst Aars Industri, the E2 10 weighs 1,800 lb., has a 104-kph top speed, cruises at 820 ft and flies off in 41.8 ft, and lands in 16.5 ft.

**SWEDISH DELTA UNITS LTD-SAGE 110** (delta) breaks its landing roll using the new, popular tail chute. The single motor has dual strokes for its single pt engine. Large cockpit canopy provides for visibility.





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## Flexonics Corporation

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Let us assure you, however, that the change from Chicago Metal Hose Corporation to Flexonics Corporation involves no change in management, personnel or methods of operation except for natural organizational changes that will make it possible for a fast growing company to serve its customers better.

M. B. (Yank) Spaulding, Jr., president with the expanding division of Air Trans

Manufacturers of Corrugated and Controlled Bending Metal Hose, Expansion Joints, Bellows, Hose, and Special Joints. Also, Manufacturers of Automobile Expansion Joints, High Pressure Stainless Steel Expansion Joints, Hose Cover Expansion Joints, and Special Joints.

## WHO'S WHERE

### In The Front Office

Donald A. Duff, formerly president of Challenge Airlines and recently vice president of Trans Air, has been elected president of the new company. Duff has 21 years of an airport experience.

### Changes

Robert B. Chapman, III, has been promoted to executive vice president of Air Trans. Chapman has been in charge of the company's operations since 1961. He has been in charge of the company's operations since 1961. He has been in charge of the company's operations since 1961.

Arthur A. Mery, Jr., has been promoted to executive vice president of Air Trans. Mery has been in charge of the company's operations since 1961. He has been in charge of the company's operations since 1961.

Ed Baughman, former assistant director of public relations for Trans World Air, has been named director of public relations. He will continue to be based in New York. Tom Bell has been named to vice president public relations. He will stay in Washington. George Haddock, former vice president public relations, has been named to vice president public relations. He will stay in Washington.

Charles Haddock has been designated as vice president of the company. He will stay in Washington. Charles Haddock has been designated as vice president of the company. He will stay in Washington.

What They're Doing  
M. B. (Yank) Spaulding, Jr., president with the expanding division of Air Trans

The 40 British Vickers Viscount turboprop aircraft on order for British European Airways will be the first of a new generation of aircraft. The aircraft will be the first of a new generation of aircraft. The aircraft will be the first of a new generation of aircraft.

## INDUSTRY OBSERVER

■ Wright Aeronautical Division, Curtiss-Wright Corp., has assembled two J45 turboprop engines and made delivery of one to Black Motors Division, General Motors, which will be USAF's second engine supplier. U.S.-assembled prototype engines were in test in less than 18 months after manufacturing rights for the Supphen were acquired from Armstrong Siddeley and 11 months after receipt of USAF contract.

■ Taurus Express Airways, Auckland, N. Z., has ordered a number of Boeing 737 aircraft for service between Auckland and Sydney to replace its present equipment. Selecting Boeing. The new Boeing turbo-prop-powered aircraft can cut 50 plus miles of air. Company estimates the 737 will reduce flight time between the two terminals from seven to four hours. Deliveries are scheduled to begin early in 1955.

■ A defense production official at Ottawa recently told Canadian news men that design engineering and production planning of a "British transonic delta wing fighter" has been under way for the A-7. The Royal Canadian Air Force is about a year with government funds. However, Aero Canada president Crawford Gordon, who has denied the company is planning production of the A-7, said the delta wing. The other British delta wing planes in flight test are the Boulton Paul P.111, the Bristol G.45 and the Fairey F.41.

■ Chrysler Australia, Ltd., has reached the half-way mark in setting up for production of the English Electric Canberra jet bomber. The company will manufacture high-pressure components for the fuselage wings, tail section, fuel tanks and special parts for the bomber. Production is scheduled to begin late, 1955. Production of the Canberra version of the North American F-86 Sabre has begun deliveries in the last stages of production planning due to living in the North American F-86 Sabre. Report from the Canberra is that engineering studies have determined that full production version will resemble the F-86 in external appearance only. The aircraft also is comparable 20 mm. cannon in place of U.S. 50-cal. machine guns.

■ First two of 12 Lockheed F4U-7 Nightingale patrol bombers purchased for the Royal Australian Air Force have been delivered to No. 11 Squadron, Perth, Australia. RAAF crews took delivery of the aircraft at Lockheed plant have been under instruction in the U.S. at the San Diego Naval Air Station.

■ Rehabilitation of Chevrolet's Teasdale, N. Y., plant is expected to be completed in an month. Since 1950 operations are now utilizing machine equipment for production of the Wright R-1550 engine. The company will produce parts for its own fuselage and wings. Total equipment of the Chevrolet Teasdale division is expected to total 3,500.

■ Curtiss-Wright Corp. New Metals Processing Division, Buffalo, N. Y., will begin production this spring. Although a pilot production line is in operation at the present time, assembly of machine tools has slowed completed production schedule. The company is importing considerable machine tooling from Europe to speed up its defense commitments.

■ Fleet Manufacturing Ltd., Ft. Erie, Ont., increased its backlog from \$10 to \$15 million during the last quarter of 1954. The company is subcontracting to General Electric, Republic Aviation, and de Havilland Aircraft and to Northern Electric for radar and antenna components.

■ The 40 British Vickers Viscount turboprop aircraft on order for British European Airways will be the first of a new generation of aircraft. The aircraft will be the first of a new generation of aircraft. The aircraft will be the first of a new generation of aircraft.

■ Four Bell H-131D helicopters participated in the recently completed atomic tests at Las Vegas, Nev. The helicopters were used in atomic tests part between bomb site and rear headquarters laboratories. The H-131Ds belong to Army's 1st Training School, Ft. Belk, Mont.



## B-36 Obsolete?

Congress is meeting on the B-36 and intercontinental bombing, but there's still some strong support for both. In the early postwar years, Congress was quick to re-evaluate intercontinental bombing as the ultimate "backbone" and "first line" of U.S. defense and advance Congressional voted hundreds of millions of dollars more than the Joint Chiefs of Staff asked for a long-range strategic air force.

But now USAF is preparing to ring B-36s with air bases, tankers, reconnaissance jets, bombers, with fighter escorts, will be able to deliver atomic attack. But to run Navy's carrier aircraft.

Here's how key members of Congress feel about the B-36 and intercontinental bombing now.

• Rep. George Mahon, chairman of the House Appropriations Subcommittee for the Armed Services, which holds the purse strings for military spending: "We can be an atomic ally on an intercontinental bombing force. It should be put down as an insurance policy during the postwar years when we didn't have anything left and other means for atomic attack. I think we should continue to build some B-36s and B-52s. But there should now be a readjustment—a switch in emphasis to counter a nation and nuclear war machine."

• Sen. Joseph McCarthy, chairman of the Senate Appropriations Subcommittee for the Armed Services, with long record of Air Force support: "Continue to advance U.S. build intercontinental bombing force."

• Rep. Carl Vinson, chairman of the House Armed Services Committee, who changed from Navy to Air Force supporter after the war: "I still support an intercontinental bombing force of B-36s as before the Air Force thinks it needs."

• Rep. James Van Zandt, member of House Armed Services Committee: "The B-36 is rapidly becoming obsolete. It is too slow and too cheap. The day is approaching when it will be used as a target aircraft for the enemy's fighters. The lighter and faster B-52, which won't have the B-36's intercontinental range, is going to be the backbone of our strategic air force."

• Sen. Russell M. Long, chairman of Senate Appropriations Committee, supporter of the controversial 75 group USAF: "A few years back, and earlier in the war, I moved away from the military budget adding \$5 billion additional for air power (later reduced to \$1 billion). There's no longer the need for the vast resources in the strategic strategic air force. I am skeptical in favor of building up carrier aviation."

• Sen. William Knowland, member of Senate Appropriations and Armed Services Committee: "There is still a need for an intercontinental bombing force."

• Sen. Homer Ferguson, Senate Appropriations Committee member: "I want to keep up an intercontinental bombing force. We don't have our aviation bases set, and we're running into difficulties getting them. We don't know what strategy will be attacked. For example, we can't launch an atomic attack with our planes based in England, without England's consent."

## Bottle of Tactical Air

There's a drive on in Congress to strip the Air Force of tactical air control, leaving USAF's offense role to strategic air.

Expect speeches on the floor of the House before long,

demonstrating USAF's doctrine of nuclear air as its backbone. Their purpose: to force reluctant Chairman Carl Vinson of House Armed Services Committee to open hearings that will serve as a springboard for legislation holding the tactical air role with Army and Navy only.

One congressional speech made by Rep. James Van Zandt, No. 2 House ranking, forced a reluctant Vinson to sit the inter-service members over the B-36 at the 1945-46.

If speeches don't avail, members of the House Appropriations Committee may go into the tactical air controversy—concerning on the transfer of Armed Services Committee, which Vinson is chairman.

## Distinction for a Nonskid

Civil Chairman Donald Noyes's New Year Day trip to Little Valley, N. Y., for an on the spot inspection of the crashed C-54 plane of Continental Airlines, a new sled, set a firm in Civil Aeronautics Board's decision, according to CAB. It was the first time, on CAB's 14-year history that a Chairman has visited the scene of a crash, according to the Board.

Noyes didn't let the publicity from the test flight on Noyes's suggestion.

• The Board Chairman took off from Washington in CAB's DC-7 transport plane at 10:30 a.m. for the flight to Little Valley, N. Y., for an on the spot inspection of the crashed C-54 plane of Continental Airlines, a new sled, set a firm in Civil Aeronautics Board's decision, according to CAB. It was the first time, on CAB's 14-year history that a Chairman has visited the scene of a crash, according to the Board.

• Noyes spent a half hour at the crash site, which included an inspection of the wreckage and a press conference.

• The test flight was devoted to a press conference on preparation and presentation of a radio interview on the C-54 crash.

• Noyes passed up a chance to go to the crash site to talk with and observe the wreckage on the crash site on 14 January.

• Then Noyes flew to New York.

## What's Ahead in Congress

• Marine Air Strength: House Armed Services Committee is trying to push legislation requiring a Marine Corps strength of four air wings, though Rules Committee for action on the House floor has it questionable. It is unclear, Joint Chiefs of Staff have approved a strength of two divisions.

Major controversy over the amount. It makes the Marine command a member of the Joint Chiefs of Staff. Army and Air Force generally adding together, now overrule Navy, in the top military command. This would be the end of the Marine Corps.

• New Board Phase: Civil Aeronautics Board is hopeful. House Interstate and Foreign Commerce Committee will start the bill on the 15th of January government will be developed at a place called in their report. With a budget Bureau of Civil Aeronautics to go.

• International Travel: Maritime strengthening strengthen and extend laws to strengthen international travel are set to go through Congress soon. Committee general work has been completed.

• Civilian flight schools will benefit from ROFC legislation that will be passed this session. The services would be able to contract with the schools for flight training. But there's no hope on the horizon for civilian aviation exchange schools.

—Katharine Johnson

# AVIATION WEEK

VOL. 56, NO. 3  
JANUARY 21, 1952

## Defense Heads Set Back Plane Production

- Aircraft manufacturing program to take an extra year, although eventual totals will be the same.
- B-47, F-89, C-119 and trainer programs affected
- heavily through new limits on monthly output.
- Schedule pushback announced by Pentagon blamed
- on low powerplant production; engine makers hit.

By AVIATION WEEK'S  
Washington Staff

defense heads are now lining up will continue longer, until eventually the same number of airplanes are built.

• The stretch out will apply to engine production as well as airplanes. For example, the stretch out on the Detroit 2400 (Radial) will have its engine peak production level reduced about 50%, and similar peak reductions on the General Electric W-34 turboprop, and the radial engine engines, and the other engine engines.

• It will involve a lot to get the effect of the stretch schedules in sub contract methods and coordination of same. That will mean that the defense and engine power production will have a lot of members of component push.

• Defense officials had said stretch explained how this problem would be met.

• On the whole, Navy officials continue to be one of the new schedule faster than Air Force contractors, but this

Ind has to be less at the very, which is biggest effect of the stretch, push back is in process and transport aircraft. But there is hardly a plane for which 1953 production levels were to be met that is not affected.

• Schedule stretch affected by a new schedule, known as "Stretch" program and Airplane Corp. which needed certification that the Air Force, but could on Chicago program to build the C-119 transport at the western Park Ridge government-owned defense plant, owned by Douglas at World War II.

• Fairchild will continue in production on the schedule at its smaller El Segundo, Md., parent plant, which is now being expanded to permit virtual doubling of the present production rate. But the schedule changes will not be applied until such that be done in the new schedule plan.

• Air Force and Navy sources, however, explained that the C-119 stretch was not due to the budget restrictions which forced the general schedule stretch. It properly reflects a revised, as well as the NATO group of European nations under the Mutual Defense Assistance Program, since its defense sources said.

• Fairchild is now trying to make other contractors available for some 500 employees already at work in the Chicago plant.

• Kees-Power-El Kaiser-Fairchild Corp. gets a contract to its schedule to build the new schedule at Willow Run, Mich., look for a second Detroit labor

## But on the Other Hand . . .

While defense planners give a healthy push back, but need to make sure stretch schedules, the Administration in Washington was talking up (minimum) just about at the same time.

• Secretary of Defense Robert Lovett explained today that the stretch production in testimony to the Senate Armed Services Committee, the committee: "We are behind in production schedules and it will take us a long time to catch up."

• President Truman's State of the Union message to the Congress called for a 10% defense effort with emphasis on air power. Everyth-

• "This year, 1952, is a crucial year in the defense effort of the whole free world. If we fail, we can lose all the gains that we have made."

• "The arms race means that the Soviet Union is producing at an amazing rate. It is still producing at an amazing rate. It is still producing at an amazing rate."

• "In Europe, we need to be helping our friends and allies to build up their defenses. This means we must send weapons in large volume to our European allies."

• "I shall recommend some increase in the size of the active force we are building with particular emphasis on air power."



politics in Washington, hence its greater success through the less cluttered canal by Detroit industry and labor groups in Washington about growing interdependence in Detroit could use the R&E airborne program from the postback.

**Michigan Senator Elmer** Stoen, quoted President Edgar Kaiser as saying his Willow Run plant would employ 15,000 more aircraft workers if they had the orders. General Willow Run employment is reportedly about 20,000, partly an aircraft and partly an auto production.

The first Willow Run-assembled C-119 is reported to fly in black. It is the only military contract now in production in the Detroit area, except a Hudson program in very early stages to build tail assemblies for the B-47 bomber.

**Transair**—In the training field, several manufacturers feel the B-47 is lower scheduling. Beech Aircraft Co. is probably hardest hit with its new two T-36 production contract pushed back to a low production peak level about half of what had been scheduled earlier.

**Delivery schedules** for General's T-28 cropship trainer program are less untidy cut, with planned peak deliveries lowered only one plane a month.

**North American Aviation's** T-38 trainer also got a push back, of similar closed proportions on its monthly peak production rate.

**B-47, F-100—Ford** America's top supplier of B-47 bombers is being reorganized. The B-47 scheduling notebook will be taken out of the Boeing Wichita program, and will not affect the Douglas-Tufts and Lockheed-Martin B-47 bomber plans, contrary to earlier reports.

**Among lighters**, Northrop Aircraft took a sharp cut in the peak delivery schedule planned for its two-place Scoutjet, if 59 lighters, with a result that the peak monthly schedule will be approximately 90% lower than the peak previously planned.

**North American's** F-86 Sabre jet fighter, it is understood, is not materially affected by the cutbacks.

It is understood that there is no revision in other bomber schedules, except for the B-47 changes.

**Engine Builders**—Prime effort during calendar 1953 will be made by the Air Force to junk up approximately 10% more previous programming. Slowdowns in deliveries as a result of the readjustment is expected to hit Navy schedules during fiscal 1954, in the last quarter of calendar year 1952. Over effort on December 31 schedule would still reach in a level not less in calendar 1953, with production level scheduled at still 1953.

Actually what is being attempted is a faster schedule of aircraft delivery schedules to meet militarily the capabilities of the engine manufacturers and electronics builders. A top Navy source explained that complexity of the modern combat aircraft has caused a complete revision of procurement planning.

The airborne, which used to be giving top consideration in production, plus wing has evolved to a streamlined "how to carry a multitude of complex gadgets—electronics, weapons, computer, etc.—now are of first importance in production planning.

**AF Head Hqs.—General**, Navy, air procurement and production programs suffer little in comparison to that of USAF. Bureau chief says that Navy programming had been slowed since Eisenhower's because of "more restrictive air rule" and because of many more demands which have been made upon its suppliers.

**Air Force**, as the other land, is particularly hard hit because of the decrease in its roles and missions again, which emphasis is on reaching a lower peak level because of budget cutback and on stretching and deliveries of complete aircraft through production of the existing 147 units in 1955. USAF insists that overall planned procurement remains flat.

**The Air Force** said that in a peak of contemplated schedules, it "will not condense the transport wing as rapidly as had been previously planned." This will have a seasonal effect on Army which has been in increasing demand of many of its ground units to airborne matters.

**Navy Plans**—Navy declares its planned procurement of transports from fiscal 1953 funds is very low. It was explained, however, that deliveries of transport aircraft ordered from fiscal 1953 and "51 funds will continue through calendar 1952. These are without change.

**Many sources** point out that Naval air strength has not been increased to the strength it comprised during its post-war peak year 1947. Navy air strength will reach projected peak of 35 in 1953, compared to 49 post-war and anti-submarine squadrons plus approximately 30 Marine air squadrons in 1955 instead of by mid 1954.

**Overall Naval** air production rate back and forth scheduled procurement from fiscal 1953 funds is a not decreased since approximately 10% over previous programming. Slowdowns in deliveries as a result of the readjustment is expected to hit Navy schedules during fiscal 1954, in the last quarter of calendar year 1952. Over effort on December 31 schedule would still reach in a level not less in calendar 1953, with production level scheduled at still 1953.

Continued programmed procurement

and production of Naval transport aircraft standards remain unchanged. This is the fact that most pilot trainers used by that service are "holdovers" from World War II with the exception of helicopter trainers. For the most part, procurement current and projected is unchanged in its number in order to still plan the fact that the helicopter are actually only-purpose for training "other than training."

## Industry Services Talk Patent Rights

Twelve manufacturers met again to discuss the patent rights in development and procurement contracts.

For the first time in more than two years, representatives of industry and the government met last week to study the patent policy on rights of invention, whether companies or individuals, as development financed wholly or partly with government funds.

On the government side was the Patent Policy and Review Board of the Defense Department, chairmanship by Rear Adm. C. M. Bunker, Chief of the Office of Naval Research, and representing the judge advocates general of the Army and Air Force.

**Value of Licenses**—The subject discussed last week arose from the fact that all developments stemming from industry-financed research are available results free to the government. But the government and industry spokesmen disagree on whether royalties should be paid to the developing company by other firms licensed to use the development at the request of the armed services.

This question has become increasingly important to foreign firms, some of which feel they have not been granted proper recognition for the new use in the matter of patent rights. Some observers feel that more foreign firms should be encouraged to "import their know-how" to this country, and that one major step would be better protection in the matter of proprietary rights.

**Okay as Principle**—Generally speaking, the military considers the principle of proprietary rights as far as development by U.S. manufacturers is concerned. But the principle tends to become less robust occasional nature.

The last broad discussion of the subject was in 1950, with the completion of legislative efforts by the Defense Air Policy Commission in 1947. Some critics say the solution presented this week to the Air Force, and approved by the Navy, is based on the need:



BRITISH LEADERS whose vision will be based on civilian efforts in the Toy government of Prime Minister Winston Churchill (center) and Lord C. M. Bunker (left), Secretary of State for War, Douglas Hailey (right), Minister of Supply, Lord Sillitoe (far left), Minister of Transport and Civil Aviation, and Lord C. M. Bunker (far right). They will discuss the subject.

## Men Around Churchill Push Air Power

By Nat McKinnick  
[McGraw-Hill World News]

London—"It is a perfectly clear," Winston Churchill said in the debate debate last December, "that as the sphere of national needs, the class of the Royal Air Force must have first and foremost emphasis and growth."

These words, reflecting words to Britain's right hand (it supplied aircraft manufacturers). Said the Secretary of British Aircraft Constructors in a year-end statement, "1952 must be a year of rapid expansion, bringing new work, new standards, new work into the industry."

**Financial Air Move**—That only last, politically acceptable administrative decision by the highest government of Britain are going to make this possible. "Fast passage" in Britain today are as common as London fog.

The no-mindfulness of Churchill and

his cabinet must be seen as largely by the transfer from over jobs of finding the experts on which Britain has, the most for commitment at other fields, the basic minimum of new capital to keep British industry of all companies, and the basic minimum for social services to keep the Tories in office.

Churchill himself is both the strongest and the weakest link in the Tory air effort. He has no knowledge as appreciation of the position of air power. But his presence on his last dual role of Prime Minister and Defense Minister, ignoring remaining criticism and his party, is giving status up. What is needed is a full-time defense minister with local power over production.

**Candidates**—Such an appointment has been named almost weekly since the election. And, however, shortly after his return from Washington, Churchill will take over service in the

defense. Two cabinet officers have been named regularly wanted for the post. Oliver Lyttelton, Colonial Minister, who was Minister of Defense Production during the war, and Lord C. M. Bunker, Minister of Transport and Civil Aviation, who was Churchill's deputy Defense Minister during the war.

Lyttelton, a tough businessman who stepped down as chairman of one of Britain's leading electrical manufacturing firms last December, was reported to have been offered his wartime job back after the election, but refused, so the report goes, on the grounds that he would not have authority to direct his former defense activities.

With a new line either Lyttelton or Lord C. M. Bunker with the office, potential production problems, Churchill will have a strong air cabinet, albeit all the other cabinet officers are new to the

At the Air Ministry, the capable and







## FINANCIAL

### Relative Market Action

#### Listed Aircraft Common Stocks

COMPANY	1948 HIGH	DEC. 31, 1948 CLOSE	DEC. 31, 1949 CLOSE	DEC. 31, 1950 CLOSE	% CHANGE FROM 12/31/48 TO 12/31/50
Boeing*	34	37 1/2	125 1/2	125 1/2	1 0/5
Bell	34	31 1/2	105 1/2	105 1/2	2 1/2
Bearing	35	23 1/2	44	44 1/2	5 1/2
Consolidated	34	30 1/2	11 1/2	11 1/2	-2 1/2
Eastman-Kodak	34	30 1/2	11 1/2	11 1/2	-2 1/2
General	35	34 1/2	47 1/2	57 1/2	10 1/2
Grumman*	4	4 1/2	38 1/2	22 1/2	-17 1/2
Lockheed*	30	30 1/2	19	28 1/2	16 1/2
Northrop	12	12 1/2	29 1/2	29 1/2	17 1/2
Republic	17	17 1/2	27 1/2	12 1/2	-49 1/2
Swedlow	35	40 1/2	125 1/2	125 1/2	10 1/2
United Aircraft*	30	21 1/2	20 1/2	26 1/2	11 1/2

\* Adjusted for all stock splits. No adjustments made for stock dividends. All figures are in dollars.

## Backlogs No Guarantee of Profits

- Stocks of many leading aircraft manufacturers were down in 1951, despite huge military expenditures.
- Inflated expectations collapsed as volume production and deliveries failed to materialize.

Aircraft equities experienced sharp mixed market reactions last year. Despite rising expenditures in 1951 as a result of increased military appropriations, disappointment in the going out of many aircraft companies was reflected in lower market prices in 1951 than in a year ago.

**History Repeats.**—Recent expectations nearly equal the historical pattern of aircraft procurement and attendant market reactions. Major bursts of strength in price for aircraft equities invariably accompany the announcement of actual announcements of orders. However, as pointed out here more than a year ago (November-December, 1948), "Renewing mass interest in how soon can the general aviation volume production level and, most important of all to the investor, what will such results mean when translated to available earnings."

As it became apparent that backlog levels were no guarantee of immediate heavy deliveries and higher earnings, inflated market expectations in many instances were soon deflated.

The accompanying table reveals the relative market action of the major

aircraft producers. Of the 11 equities listed, eight showed varying degrees of the 1951 year-end compared with Dec. 31, 1950. On the other hand, no more showed a wide range of gain during the same period.

For comparative purposes, the 1948 high prices are shown along the price and closing prices when most aircraft issues were at depressed levels.

**Declines.**—The largest market decline was recorded by the common stock of the Grumman Co. This equity was down 30 1/2% from the 1950 year end. This action is nothing more than a reflection of the financial difficulties which were recently experienced by the company.

Also showing declines were Eastman-Kodak, Republic Engine, Republic Grumman, North American, Consolidated and Bell. In most instances it is not all year earnings as anticipated for 1951 is contrasted with 1950.

**Improved Performance.**—The best market performance of 1951 belongs to Bell Aircraft. This equity showed a small appreciation of 27 1/2% during the year. Its 1951 year-end closing price was almost three times that recorded Dec. 31, 1949, and closely approached the levels experienced at the 1946 peak.

The improving earnings of the company, together with its prominence in the helicopter field, are responsible for this excellent market showing. The company has also announced plans to split its stock, two shares for one.

Douglas Aircraft also did well for its market adherents last year. A gain of 23 1/2% was contributed in Dec. 31, 1951, over the 1950 year-end. Further, the equity surpassed its previous peak market price of 1946. While earnings and outlook formed the basis of this showing, it took a stock dividend in developing and market interest of a broader nature in this equity.

**Stock Dividends.**—Stock dividends are used prominently in the aircraft group last year. In addition to those already indicated, Lockheed effected a new five-for-one split in July, 1951, and United Aircraft Corp. declared a 20% stock dividend on its junior equity. In all instances where stock dividend action was taken, rising earnings served as a potent underpinning.

Stock dividends in themselves create no additional value. The equity interest in the security remains the same. But it does serve to broaden ownership in a company while affords a tax-deferring property being made. It serves also as a means of providing a new base for increased cash dividends.

It will be noted that, in addition to Bell and Douglas, other issues have at least equaled or surpassed their 1946 peaks. These include Boeing, Grumman, Northrop, United Aircraft and North American. All far surpassed from the best prices of 1946 are the equities of Consolidated and Republic along with Majors.

General was down at the 1951 year-end from its 1950 closing price by 16 1/2%. However, this equity was also the market performer in the aircraft group during 1950. The company had declared two separate 100% stock dividends in recent years.

Once again the market experience of the aircraft group has demonstrated their complete lack of volatility.

These varied tendencies were more pronounced than ever during 1951. There was no uniform trend for the year that acted up and down a wide percentage range. It is the group that declined the common were again wide. Subsequent earnings, where present, seemed to be contented in or touching the path to 1946 peaks.

Selectively, always present in the aircraft group, will become even more so during the coming year. As the individual companies produce and establish their ability to develop earnings power so will market evaluations be made of their separate equities.

—Selig Altschul

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# AERONAUTICAL ENGINEERING



11182 In WHEEL CAA crash out crash tests of aircraft fuel tanks at its Vehicle Development and Evolution Center

## CAA Crash Studies Give New Safety Data



CAUGHT IN THE IMPACT—jet fuel tank booms from booster into rocketry.

- Fire is known to be a major killer in crashes.
- Now tests show how to cut down this fire danger.

The high toll this fire takes in jet-vehicle plane crashes has led to more fire studies giving new safety data to aircraft designers.

Statistics on domestic and international scheduled passenger air carrier operations from January, 1978, through June, 1983 indicate this toll:

- Crashes not followed by fire were fatal to 60.8% of the occupants.
- Crashes followed by fire jumped the fatality rate to 84.6%.
- This indicates that the difference—23.8%—was caused by fire, CAA says.
- CAA Study—Known to crash fire problems are being focused out by the Civil Aeronautics Administration in a comprehensive testing program at its Vehicle Development and Evolution



INTEGRAL TANK after impact shows explosive effect of crash.



ENCLOSED SELF-SEALING tank after impact ruptured column.



SOFT ALUMINUM SHELL tank ruptured in deceleration test.



MAJORITY CASE, tank deceleration test causes halfhead failure.

Center at Indianapolis. A key part of the study is aimed at the development of aircraft fuel tanks possessing a greater degree of rupture resistance than existing tanks.

What CAA has found in its crash tests is not unexpected by Robert Schmitt, chief of the agency's structural branch, aircraft division, in a paper delivered at the recent Society of Automotive Engineers National Aerospace Meeting in Los Angeles.

• Tank Strength—An initial consideration in CAA's planning was to determine how strong a crash resistant tank should be. There was no reliable basis from which to formulate an answer to this point, but it was obvious that it would be unreasonable to expect perfection of tank capacity in those studies where severity of the impact left no chance for personnel survival.

That meant that the program should be directed at the development of fuel tanks to retain capacity only under moderate severe crash conditions.

Safety belts and supporting structure were considered capable of sustaining personnel up to 19Gs. But it was be-



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The principal engineering characteristics of Incoloy are:

- **Oxidation Resistance**—The oxidation resistance of Incoloy is of the same order as Inconel. It has a chromium content of 25%.
- **Physical Characteristics**—Physical constants are similar to type 330 stainless steel.

- **Expansion co-efficient**—The expansion co-efficient are approximately those for Inconel. Thus Incoloy should have about the same high temperature resistance to cracking under drastic temperature changes. Because of its relatively high nickel content (34%) the structure of Incoloy is stably austenitic showing no tendency to become embrittled by precipitation of sigma or carbide phases after prolonged exposure to intermediate temperatures.

- **Room temperature properties**—Room temperature mechanical property ranges of Incoloy mill forms are shown in the table on the left:

- **High Temperature Properties**—High temperature strength properties of Incoloy are comparable to those of Inconel.

In terms of behavior in various high temperature environments it is anticipated that Incoloy will be superior to Inconel in resistance to sulfidation, green-rot and molten cyanide salts. Incoloy is comparable to Inconel in resistance to acidities.

- **Work Hardening**—The rates of work hardening of Incoloy and Inconel are practically identical.

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Hot Rolled Bar					
Condition					
As-annealed	75-100	30-35	30-50	120-170	40-84B
As-rolled	100-150	40-55	30-50	180-250	900-120C
Hot Rolled Sheet					
Condition					
As-annealed	75-100	30-35	30-50	120-170	40-84B
As-rolled	100-150	40-55	30-50	180-250	900-120C
Welded	80-120	35-40	40-55	135-200	74-84B
Wire					
Condition					
As-annealed	75-100	30-35	30-50		
Plate					
Condition					
As-annealed	75-100	30-35	30-50	120-180	
As-rolled	80-120	35-40	40-55	135-225	
Sheet					
Condition					
As-annealed	75-100	30-35	30-50		88B (max)
Deep drawing and spinning quality	75-100	30-35	30-50		88B (max)
Strip					
Condition					
As-annealed	75-100	30-35	30-50		88B (max)
Deep drawing and spinning quality	75-100	30-35	30-50		88B (max)
Tubing					
Condition					
As-annealed	75-100	30-35	30-50		88B (max)

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bores, even though the fuel tanks are intact and not leaking after the crash impact. Although fuel from such sources build up more slowly than when failure of the fuel tank is involved, and cannot cause base fire escape and attack, they can spread readily to the fuel tanks and result in rapid destruction of the aircraft.

• Fuel lines have broken numerous times in the nacelle as a result of engine movement, but they can be broken between the engine and tanks and become tanks themselves.

• Ignition of fuel results from hot engine parts, flame in the engine exhaust and intake systems, sparks from the engine, lightning strikes and electrical accessories, broken wires in the engine, electrical system, and sparks from striking metallic parts. In actual crashes, it is not generally known how ignition results, but it is generally accepted that the engine is the most probable source of fuel ignition.

• Tanks with other flammables, such as lubricating oil and hydraulic fluid, offer a serious hazard in a source of small fires which can spread rapidly to the fuel tanks.

### Test Methods

For its tests, CAA used a catapult carriage track arrangement. The fuel tank, on the carriage, is propelled down the track, at desired speeds up to 100 mph. The tank is brought to a stop at the end of the track by engaging gear or it can be allowed to slide from the carriage and crash into the backdrop. We're satisfied all fuel is carried in the tanks.

Reproduction of basic types of forces rather than an attempt to reproduce the exact conditions found in specific crashes, says Scherer, is the only practical approach to the testing problem. These basic types of tests, he says, are believed to give the principal type of rupture forces experienced in crashes.

• Deceleration test. Here the portion of a wing section containing a fuel tank is rigidly attached to the test rig, projected down the track, and stopped by the springing gear at a predetermined rate of deceleration. Attachment to the wing section is made through the spar, struts and skin to simulate the path of load transmission in an aircraft structure.

• Impact test. In this case, the carriage is arrested at the end of the track, but the tank is allowed to slide off and crash into the backdrop, which is lined with a vertical 3-in. solid lead. This test simulates effects of penetration and change in shape and volume of the tank structure.

• Deflation test. This is conducted to introduce into the fuel section loading and torque loads of sufficient mag-

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## New J & H Standard System Has Wide Application

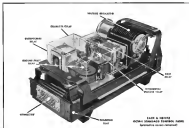
Although rated as standard equipment, there has been no "standard" electrical control system until recently. In the past, each vehicle system has been custom-built for a particular application. Now many manufacturers, including Jack & Heintz, along with selected other manufacturers, collaborating with the Military Services on the development of a "standard" 28-volt, dc system. Now, due to the combined efforts of the group, a good "standard" panel system has evolved which can be used on many types of planes with little or no modification. This new system, shown at right, is now available from Jack & Heintz. It is being built to JAMEC's MIL-STD-883A. The J&H designation is GC34-J.

Features incorporated in the GC34-J offer the following protection: selective overvoltage, feeder ground fault, generator ground fault, reverse polarity, reverse current and pull-down voltage. Other features include: wide and long-life voltage regulation, high interrupting capacity, connections, automatic ground fault, simplified trip-free resetting, remote or manual resetting, and simple panel installation on a mounting tray.

The central panel components include a voltage regulator, differential voltage and reverse current relay, overvoltage relay, ground fault relay, field relay, regulator relay, rectifier, battery monitor, three test jacks, manual reset device, central panel plug-in electrical connector and fuse kit.

Some of these components are manufactured. Others are carefully chosen by our engineers for incorporation in the system, selected on merit alone from a long list of suppliers, manufacturing the devices. Thus, with an open mind and complete freedom to select components, only the best are used in J&H systems.

The following aircraft equipment operates in conjunction with the new "standard" panel and generator. With the panel, the complete generator con-



### J & H Engineers Simulate Most Severe Conditions in Systems Tests

Exhaustive testing is a religion at Jack & Heintz. The ability of any device we make to meet normal conditions is just a beginning.



In the J&H "test house", electrical control systems are being tested under conditions that simulate battlefield, even to wiring and loads.

and systems are aircraft engine-driven generators, conforming to Specification AN-G-34, (max capacity) two 250-amp/115-volt dc and generator switch.

Because a complete "standard" electrical control system must meet so many different conditions, we design and build each of the test equipment we use.

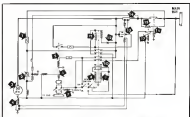
These systems simulate conditions which actually increase the loads of aircraft operations in many ways. The addition of each device is carefully considered. Our Systems Test Laboratory, accordingly, simulates the effect of additional positive current on the complete system by working failure, to prevent it later in actual service. Customers are invited to be present during shake-down runs and to help us try to make the system fail, to measure its failure dependability.

And testing doesn't automatically end there. During "back-up" tests of the system in the customer's plant, we usually have one of our engineers on hand to witness the tests, perform modifications to meet new requirements and generally assure the system performs satisfactorily.

## ... Standard Control System

### SCHEMATIC DIAGRAM OF GC34-J PANEL AND ASSOCIATED EQUIPMENT WITH KEY TO FEATURES

1. Battery monitor—Indicates proper polarity of each field.
2. Voltage regulator to 140-145V.
3. 28-volt generator.
4. 28V-24V relay.
5. Overvoltage relay—Generates output and energizes field relay trip circuit on an overvoltage fault.
6. Selector on 0—On parallel system, correct paralleling current and reduces trip value of overvoltage relay on faulty output.
7. Reverse relay—Connects regulator circuit for paralleling.
8. Field relay reset—Circuit energized from the main line on closing reset switch.
9. Field relay interlock—Prevents trip-free resetting while.
10. Auxiliary circuit breaker contacts.
11. Field relay trip coil—Open field relay circuit on fault.
12. Shunting switch—Closes field relay trip circuit when reversed generator is not needed in system.
13. Ground fault relay—Senses resistance to voltage across circuit, closes field relay trip circuit on a generator or generator feeder fault.
14. 250-amp/115-volt circuit.
15. Differential voltage coil—Closes main generator circuit when generator voltage is above test voltage.
16. Active monitor—High interrupting capacity.
17. Reverse current coil—Generates current field drop and opens main generator circuit on reverse current.



### Chief Engineer's Corner



"System" as defined by J&H Engineers is a "combination of the minimum number of components of the most rugged design, assembled into a single, reliable mechanism to accomplish one or more functions as specified by our customers."

Any engineer can design a system to accomplish a list of functions. But the amount in design skill is necessary to add the requirements of aircraft simplicity, maximum reliability, ease of maintenance, minimum adjustment, experience and knowledge of aircraft requirements.

Several jobs are on our engineering staff... they consider our equipment from the cockpit viewpoint. That's why we often ask you to let our engineers see your equipment, and why we welcome the opportunity of discussing your problem and future plans with your engineers.

After our capable engineers have

designed your system, we know that before it is shipped, it must be working out in our Systems Test Laboratory. We know we'll find some "bugs" and we'll welcome your visiting us during the tests to help find them.

Ask for the new J&H Technical Bulletin No. 1150-K. It includes a complete table of models and specifications. Write JACK & HEINTZ, INC., Dept. 399-B, Cleveland 1, Ohio.

### Protection Offered Under Tough Conditions

The GC34-J Standard System and associated equipment are designed for maximum duty to insure and protect generators under the following tough conditions or actual combination of conditions:

- Barometric pressures ranging from 30 inches of mercury down to 3.5 inches (equivalent to altitude of 50,000 feet).
- Temperature range—-67°F to +160°F.
- Relative humidity ranging up to 100%.
- Exposure to airborne sand and dust.
- Exposure to vibration.
- Exposure to fog.
- Operation within specified limits in any position.
- Exposure to aircraft vibrations.

\*Military specifications numbers on most items are on request of product specifications only and do not necessarily apply to all equipment configurations.

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*Rotomotive*  
**EQUIPMENT**



marine electrical, hydraulic or mechanical devices designed to solve unusual problems of developing power, controlling it, or using it.



Aircraft designers have  
learned to count on  
**S.S. WHITE flexible shafts**



Take the case of a typical aircraft technician. It indicates engine speed in terms of r.p.m. But this important information can only be as reliable as the messenger that delivers it—the flexible shaft. And because reliability is paramount, aircraft designers have learned to count on S.S. White flexible shafts to perform this all-important task of providing a direct mechanical connection between the engine and the instrument. Experience has proved that S.S. White flexible shafts give fully dependable service under all types of aircraft conditions. They require little or no attention and are virtually immune from any kind of trouble that might affect their operation including vibration, extreme temperature changes and varying speeds.

When your design calls for power drive or remote control, it will pay you to consider first the many outstanding advantages of these versatile S.S. White "Metal Muscles."

SEND FOR BULLETIN 506B. It contains essential facts and data on flexible shafts and tells how to select and apply them.

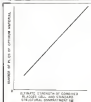


**THE S.S. White INDUSTRIAL DIVISION**  
DENTAL MFG. CO.



Dept. V, 10 East 40th St.  
NEW YORK 16, N. Y.

WESTERN DISTRICT OFFICE • TIMES BUILDING, 6040 BEACH, CALIFORNIA



PILOTS SHOW most weight of blade section is well exposed for repair (upper graph) and tank strength is plus of normal (lower graph)

inadequate to cause partial failure of the tank and wing structure. The condition is applicable particularly to integral type tanks. Inspect is obtained through steel structure attached at each end of the wing section. Position of the steel structure creates combined chordwise bending and torsion forces.

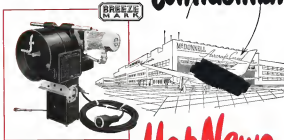
These three tests says Seligman, can be applied to any type of fuel tank installation in a wing structure and show how structure and fuel tank respond to these aerodynamic and momentary forces involving basic forces in aircraft crashes. Combined results of the tests on one model of tank show its specific weaknesses and allow an overall error bar of its crash resistance.

#### Conclusions

Here are conclusions drawn from the fuel tank program:

- No present design of fuel tanks is in use in transport-type aircraft will withstand any reasonable degree of forces encountered in crash crashes where personnel can be available to survive the crash impact. This

the Installation is **Confidential**



but the **WINCH** is

**Hot News**

#### PROBLEM:

To spend the changes of jet engines—anywhere, anytime—on the line or in the field.

#### SOLUTION:

A portable battery-operated Breeze Engine Winch, quickly installed in the aircraft itself, permitting removal or installation of the engine at will, with drums for 300 inches of cable. Weight: 105 lbs., Load: 2,600 lbs., Motor: 27 volt DC, reversible.

Another Breeze Mark product, typical of the advanced engineering developments the aircraft industry has come to expect from Breeze Corporation.

**WRITE TODAY** for complete information on this lightweight, battery-duty winch which, besides providing power almost with a quick-charge in the field, may well facilitate new departures in future design.

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Close-up view of winch with cover removed, showing detail of cable drum and other mechanisms.



often to the area where high, local impact forces are obtained as the wing at the fuel tank location, or where the wing tends to break off through the fuel tank section.

No design of fuel tanks at use today is regarded as better in this respect than any other type.

• **Load distribution** is not even during the type of crash conditions considered. Some portions of the aircraft structure are, as the average, subjected to lesser or greater loads than others. The strength and weight tank required would depend on its location.

• **Prevention of crash fires** as fuel tanks is best prevented where the tank is placed inboard at the wing at a location where landing probably will not occur, the tank is placed behind a reasonably heavy spar and leading edge section which can absorb direct impact, is enveloping in a fire, and, finally, to keep the wing away from the ground, the tank is designed to withstand high impact and deceleration loads, and landing gear loads are not applied directly to the tank structure.

• **Flexible bladder tanks**, which are free to shift in the structural compartment, and have excellent strength and energy absorbing properties to resist rupture when the surrounding aircraft structure

dismembers, offer the most promising and viable flexible structural solution. • **Automatic disconnect**—couplings should be installed at proper locations on fuel lines to seal the fuel in the line, and prevent their leaking, because of separation of the engine from its source, shutoff of fuel tanks, structural leakage, etc.

• **Bladder Tests**—Although CAA, in collaboration with a rubber company, already has developed a bladder tank, still has tried up under simulated conditions with loads exceeding 20G, additional tests are being conducted to determine if this is the final answer. An optimum tank, according to Schroeder, will have a high ratio for energy required to rupture the bladder cell material under dynamic load to the net weight of the material.

A large number of representative fuel tank bladder cell materials are being checked. Specimens are fabricated in circular panels 14½ in. across. Grid lines on the panel facilitate photography and evaluation of test results. The panel is fastened in a desiccator to a steel tank by a couple of bolts. The length, or "head" of the tank corresponds to the head of fuel tanks in modern transport-type aircraft, whose head is defined as the length of the

tank parallel to the longitudinal axis at the head.

The tank is projected down the tank at speeds up to 180 mph, then suddenly stopped by the arresting gear near the end of the run. The resulting fluid pressure on the tank corresponding to the number of Gs applied in the test replaces the drag force.

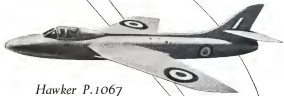
From data obtained a curve can be constructed from the lines of points representing these materials showing the most used, as the optimum process, in relation to their weight. The best material is that appraised by the point at the top of the curve. To achieve this accuracy, bladder cells of the optimum material will be installed in a standard structural compartment embodying the strength properties of a typical supporting structure, then subjected to deceleration and impact tests.

Using the optimum material with a wide range of plies, a curve will be established for the relationship of the number of plies and ultimate strength in Gs of the bladder cell and structural compartment. This ultimate strength is synonymous with fuel tank design load.

When a final solution for the bladder-type tank is reached, the remaining type tank problems will be tackled.

## In Defence of the Realm

The World's Finest Fighter Aircraft



Hawker P.1067

Ordered by the R.A.F. into mass production straight from the drawing board, the new Hawker P.1067 entered the world when it was shown for the first time at the Farnborough Air Show. With clean, dynamic swept-back lines this bullet-fused gun operator is built to run like a race car on the world's speediest road. Moreover, the two clients in lightning speed correct a fluid assessment and transfer capacity to combat conditions. It is the world's finest. Such supremacy in single-seat fighters is well in keeping with the tradition of Hawker Aircraft: the firm which gave us the Hurricane, the Spitfire, the Tempest and the Phantom. Hawker's work is greatly aided by drawing on the vast experience and research facilities of all members of the Hawker Siddeley Group. This industrial consortium of companies, large or of kind, is pledged to building the progress and dynamic strength of the Free World.

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- Liquid Tight
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The ability to carry maximum current with only a minimum voltage drop is an outstanding characteristic of Bendix Scinflex Electrical Connectors. This important feature is only a part of the story of Bendix access in the electrical connector field. The use of Scinflex's dielectric material, an exclusive Bendix development of outstanding quality, increases resistance to flash over and arcing. In importance from

-57°F. to +275°F. performance at reasonable dielectric strength is never less than 500 volts per mil. All in all, no other electrical connector combines so many important exclusive features as you will find in Bendix Scinflex connectors. For higher efficiency in your electrical operations be sure to specify Bendix Scinflex. Our sales department will gladly furnish additional information on request.

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## ENGINEERS' NOTEBOOK



ALIAS  
SYSTEMS

### V-BAND COUPLINGS

simplify assembly and maintenance

Marmar V-Band Couplings connect two valves and expansion joints of the Douglas C-124 Globemaster II anti-icing and cabin heater. They withstand a temperature range of -65°F to 450°F with an operating pressure of 25 p.s.i. Marmar sheet metal flanges welded to the ducts provide a quick, economical seal and the quick-coupler feature of the coupling latch speeds assembly and disassembly.

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STANDARD CLAMPS FOR SPECIAL APPLICATIONS



### How Much Work Can Frigid Digits Do?

Fifty degrees below zero is numbing cold—but the Air Force has to keep 'em flying over in such frigid Arctic weather.

Up till now, planes have been getting the best's share of heaters and other means of combating cold. And the men who work on the planes have had to huddle and freeze.

The Air Force doesn't know what kind of gloves should be worn, for example. Neither does it know how much work a machine can be expected to perform during a peak period.

To find out, Lt. Robert A. McGowan, research psychologist at the USAF School of Aviation Medicine, Randolph AFB, Randolph, Tex., is conducting a series of tests in a cold room.

▶ **Testing Device**—To measure mental dexterity in extreme cold, Lt. McGowan designed a wooden box roughly the size of a tool chest. It has a lid fastened securely by both sides with lockers. And inside the box is a bench assembly from a B-50 Superfortress propeller.

A volometer stream (from the back framing, corner of Lockheed A7H) drawn in standard USAF Arctic markings the job of opening the box, disassembling and reassembling the bench unit, and locking the box open. Derating test, temperature of the room is maintained at an Arctic level.

Tests to do the job, skin temperature, personal reactions and comments of the subject are recorded and correlated to stress on index of cold-weather performance.

Lt. McGowan expects to find basic facts about mechanical ability in Arctic environments. And when these facts are analyzed, they may lead to more resolutions for new clothing, to new criteria for personnel selection for Arctic duty, to new standard performance tests for readiness in any kind of weather.

## Help a jet go further..faster ..with the new Thompson AIR-TURBINE PUMP



Again, Thompson leadership brings you a Thompson "First" . . . the first fully-proved, service-tested air-turbine pump.

New, and proved in the air, the Thompson air-turbine pump uses air from the jet compressor to pump fuel to the afterburners for additional jet thrust. It can produce a pumping effort equivalent to 35 H.P., yet weighs only 9.0 lbs.

Designers like the flexibility of placement and installation that the Thompson air-turbine pump provides.

May we tell you more about this newest Thompson development and other developments of air-turbine accessories?

Thrust afterburner pump model weighs only 9.0 lbs., but delivers 35 H.P.

Air turbine operates at speeds up to 30,000 R.P.M. with 500° F. air. The pump will operate over -65° F. to +150° F. temperature range. Can be used with all military fuels.



ACCESSORIES DIVISION

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## the truth about Dow Corning Silicones...



...is more fantastic than the patter of the pebbles or the spall of the bankers that doubled in advertising and sales a generation ago. For example:

- **Silicone IC** Class H electrical insulation makes motors and other kinds of electrical equipment last 10 times as long as they ever did before.
- These same insulating materials are used to double the power per pound rate in electric machines.
- **Silicone™** the Dow Corning silicone rubber is used to seal hot oil at 800°F, hot air at 350-400°F, hot water and benzene bay doors at -100°F.
- Dow Corning Silicone oils and greases make permanent lubrication a practical reality.

To many engineers and executives, such silicone facts as these still sound too good to be true. That's why we have built and assembled 16,000 pounds of demonstration units and typical applications to prove that our silicone products will do all that we claim for them. This is the first comprehensive Silicone Exposition ever assembled. Previewed in Washington, D. C. during the week of October 22nd, the exhibit will be given private drawings in major industrial centers across the country.

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## AVIONICS

### AF Base Uses Homemade Homer

Delivery was uncertain on equipment to bring in lost pilots, so three CEA employees built it in two days.

Severity and about 5700 combined in Operation Snowfall have brought nearly a score of lost aircraft safely home to Columbus AFB, Miss. Snowfall is the codename given to a homing antenna built from miscellaneous parts by three employees of Col. James E. Davis, Air Force Academy, civilian contractor operating the base.

Snowfall proves the old axiom about necessity being the mother of invention. The intended target of night light training at the base made it imperative to locate some kind of homing antenna for guiding lost pilots. And delivery of electronic equipment being what they are, the base couldn't wait to get the needed unit manufactured.

Instead, three Col. E. Davis employees—Joe Moore, Robert Montgomery and Gerald Dykes—constructed a homing system within 48 hours of being asked to tackle the job. Later, the homing equipment was tested and proved up a lot, and a motor and antenna unit have been added.

**Antenna**—Snowfall is a cylindrical parabolic antenna with closed ends. The search is 110° in search length—the distance frequency of 121.5 Mc. Depth of the cone is 30 in., half a wavelength, and the height is 16 in. A standard AN-1044 mast is located at a wavelength behind the mouth.

The antenna frame is lightweight tubing covered with hardware cloth. Supporting structure is a galvanized channel, from which extends a galvanized shaft to which the tape is fastened. The unit can be rotated by means of a motor actuated from an unmovable propeller hub unit.

Overall height of the assembly is about 15 ft., but extended height to antenna tip is 77 ft. With this extension, contact can be made with planes as far as 150 mi. away, depending on flight altitude.

The rotating drive from the motor does not provide continuous rotation of the antenna, instead, it must be removed at the completion of each complete revolution.

Receiving signal comes from a Seleno pointer through two monostatic helix units as driven by the same motor that rotates the antenna.

**In Operation**—When a pilot desires



heading are difficult enough so that there is no difficulty in determining between the two.

Actual bearing vector is read from a Seleno indicator and the lower can then give the pilot the correct heading to intercept the base.

Refinement on the apparatus include the availability of a number of voltage meters to take care of varying signal strength due to range, and means to cut out the automatic voltage control to get sharp peaks of the indicated voltage.

### NBS Unit Sorts Telemetered Data

Four telemetered levels can be supplied to each channel of telemetered data figure by a new calibration unit developed by the National Bureau of Standards. The unit sorts and operates switches for transmission control.

The device was designed to identify telemetered information from a ground station in flight. But components and durability make the unit particularly suited to applications in aircraft and spacecraft as well.

The calibrator supplies each telemetered channel of the telemetering equipment with four sequential reference of modulation. In this way, the signal is provided with known levels of modulation from which correct data may be interpreted.

Two groups of receiver, computerized switches per transmission control. The first group interprets levels of modulation from the ground station of information to the transmitter. In place of this, the calibrator circuit is connected to the output.

The second group of switches passes step-by-step signals to the transmitter during the interpretation provided by the first group of switches. The step calibrator can cycle ten times in each cycle of the interpretation from modulation signals are passed with each cycle of the cycle. Each interrupted channel receives identical calibrating signals.

Switches and units are housed in a chassis 1 in. long and 4 in. in diameter. Drive motor is both transmitter and calibrator units is mounted at one end of the calibrator.

Experiments to 10 channels is possible. It involves installing ten more switches, increasing the width of the flow speed can and enlarging the housing. Such an arrangement would permit calibrating two channels simultaneously.

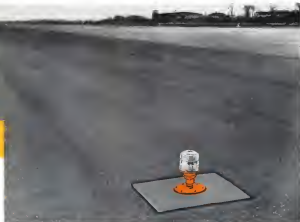
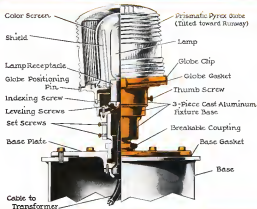
The mechanism can also be used to modulate the transmitter during flight checks. The calibrator simulates telemetered information and permits adjustment and testing of the transmitter to recover prior to flight.



# CROUSE-HINDS -NEW-

## Fixed Focus Bi-Directional HIGH INTENSITY RUNWAY LIGHT

A radically new optical design that utilizes all the light from a 200-watt lamp.



The CAA recommends that all instrument landing runways be equipped with high intensity runway marker lights so the runway can be properly outlined to a pilot either day or night under conditions of poor visibility.

Crouse-Hinds type HRL marker light is constructed in accordance with CAA specification L-439 and consists of a 200-watt marker light head assembly with a prismatic lens optical system, a breakable coupling, and a base plate.

It is designed to utilize the greatest possible amount of light from a 200-watt lamp. The Pyrex prismatic globe directs powerful beams of light up and down the runway. On the off runway side, type HRL gives a much higher candlepower than the minimum specification requirements, which enables the pilot to easily locate the runway while entering the field.

### Advantages of type HRL over:

1. Less Hazard to Aircraft—due to light weight and low mounting height.
2. Fewer Encountered Obstacles—only a single No. 8 cable is needed.
3. Converter Feature—Type HRL fixtures may be modified to most existing types of search marker light bases.
4. Small maintenance and space requirements.

The Crouse-Hinds Company offers all three types of high intensity runway lights: Type HRL (illustrated above) to meet CAA Specification L 439 type HRC to meet Specification L 438, and Type HRL to meet Specification L 435. All are approved by CAA, and all are carefully built to Crouse-Hinds high standards of quality from the finest materials.

Crouse-Hinds engineers are available, on a routine basis, to offer expert technical advice on the advantages of any of these three systems. An outline of the main features of each system, including installation notes, is included in Bulletin HRL-1. Send for your copy today.

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## PRODUCTION



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SEPARATE compartments protect G-17 jet engine work.



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## Special Mobile Ryan Racks Protect Parts

Custom-tailored carts make handling easier, save floor space, cut damage to engine components.

Moving and storing metal parts in various phases of a manufacturing schedule, if not planned carefully, can be a headache—a cumbersome and expensive operation.

Reas Aircraft Corp.'s plant engineering mechanism design group came to this conclusion and did something about it—with special, custom-tailored racks that put off as little wear as possible.

• Visible factory space is saved

- Handling is easily eased
- Expensive engine components are given more protection against damage

Some of the previous parts that Ryan has to hand moved to shop include external fuel tank trays, exhaust systems and header sections, and jet engine nozzles, struts and combustion cases.

The conventional open top tote cart—a box on wheels—was easily employed for moving these parts to re-

pository, final packing and shipping. This convenient, pushed by a worker, introduced the danger of the parts knocking against each other.

Another poor feature of this tote cart was the lack of the top-mounted wheels. The loading scheme was the haphazard method previously involved in stacking the parts into carts which had not been designed to accommodate them in the first instance. The loading scheme was left strictly to the ingenuity of the individual, who generally divided the components in accordance with his own, for best utilization of cart space. In some instances, the units being stored wouldn't fit and hang-



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New plus values—new designs—new uses! AMP solderless pins, plugs, hooks, contacts, and specially shaped terminals do more than give sound electrical contact—they can be incorporated into the design of the product itself! Keep AMP in mind to simplify wiring, eliminate unnecessary parts, speed production, and reduce cost.

With wire termination it's installed cost that counts. Set up fast, efficient AMP automatic machines for production runs of 2,000 to 4,000 complete terminations per hour! Terminals feed in strip form from spools. Each connection is strong, neat, uniform.

AMP's superior design, production, and performance tolerances have yielded approval for critical applications by U. S. Army, Navy, Air Force, and various civilian agencies. List on request.

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Recent tests on 14,000 AMP solderless connections prove that AMP terminals WILL NOT PRODUCE NOISE even after more than 2 years in unfavorable atmospheres!

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INTERNAL feed tank may cut back together on new rule. A-1. Old was on right



14" SURE 15 stacked in outside rack, probably parts in barrel, lower than upper



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over the cast side, put up for day

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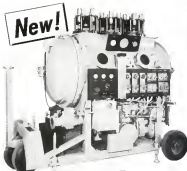


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Feeling, as in the case of the former test cart, is not. The new risks can be pulled, swung at a time, by a small team.

## USAF CONTRACTS

Following is a list of recent USAF contracts announced by Air Materiel Command.

**Armstrong Corp., Jackson, Miss.**, awarded an improvement B-44s, value \$2,113,113. **Armstrong Hardware Mfg. Co., Dallas, 219** Milwaukee St., New York, awarded \$449,500, B-71-10.

**Mannings Co. of America, 1400 West 1st St., Minneapolis 27**, announced award, \$12,100.

**Auto Air Handling Co., Toledo, Michigan** 1700 W. 41st St., awarded \$10,000.

**Auto Aircraft Corp., Wichita, Kansas** awarded \$10,000.

**Boil Aircraft Corp., Niagara Falls, N. Y.**, awarded \$10,000.

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U.S.S.

**SHELBY SEAMLESS Aircraft Tubing**

UNITED STATES STEEL



# Air Research Extends Gas Turbine Field

• Use for auxiliary power in aircraft is rising.

• Sizeable Navy orders point up the trend.

By George L. Christian

Los Angeles—The gas turbine has continued to step into another energy supply role—aircraft auxiliary power.

Indication of the extent of this new use is the 547 orders in orders which Air Research has been awarded by Navy's Bureau of Aeronautics for one-thirty turbine powerplants. The bureau represents the largest production order ever placed by the military for small gas turbine engines, according to J. C. Gault, president of Air Research's parent, the Garrett Corp.

Among the turbines is one for use for driving the alternator on Martin P5M-1 and Chance Vought F7U aircraft, the manufacturer says.

■ In Solid-Thrust Air Research has entrenched itself squarely in the market of gas-turbine-powered aircraft power units. The company often complete systems, from power source to air (or gas turbine) motor, based on eight years of intensive research in the small gas turbine field. The company says, "This Air is Our Business."

Air Research's interest in gas turbines has not been so much to place a turbine as to put it into direct competition with the piston engine, according to Horace J. Wood, the company's technical chief engineer in charge of turbine machines. Rather, the company tries to find gas turbine applications that the piston engine could do with efficiency at all. And Air Research felt that auxiliary power systems should follow the precept of the main powerplant from piston engine to gas turbine.

■ Navy Order—Components in the large Navy order include auxiliary gas turbine engines, gas turbine starters and control units for seven types of Navy fighter and subsonic aircraft more featured by five major aircraft main planes.

Already in substantial production on a moving assembly line, the new solid thrust turbines will boost Air Research production to thousands of units annually for several years. To speed up output, the manufacturing facilities of the company's main plant here will be



GAS TURBINE COMPRESSOR is the heart of Air Research gas turbine power units.



COMPACT IN STAINLESS STEEL, component is completely packaged auxiliary powerplant.

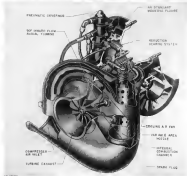
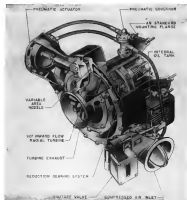
expanded by the numerous of the firm's latest production facility, a new six plant has just been opened at Phoenix, Ariz.

■ With the Gas Turbine—Power is, specifically, low thrust auxiliary systems have succeeded with the conventional engine and complexity of aircraft accessories and systems.

Multiplane altitudes have enough cut the operating problems of these

accessories, which are usually installed all over the airplane. The components operating efficiencies are also seriously impaired by heat, cold air.

Wood estimated that at today's extreme altitudes "problems have been considered when the power utilized by the aircraft for services other than propulsion has amounted to between 5-10% of the available propulsion power." A figure of 5-10% would be an



POWER AUXILIARIES are turbine motor (top), gas turbine motor (bottom).

engine for plane operation at sea level. Complication of the problem of power multiple drives of considerable horsepower on the aircraft drive case of an engine that is situated in weight and dimensions has hampered the form of many as engine.

The trend to shorter nacelles, by lowering the introduction of gas turbine powerplants, further complicates the burden of hanging chains of accessories directly on the engine. And the greatly increased weight of the accessories may impose drag on the engine's accessory case.

Air Research holds that the "best as duty power arrangement strikes load auxiliary power units and more propeller engines in a power auxiliary—and turbine, that compressed air (low pressure) is highly desirable as a power medium. (The company) does not attempt to prove that the system proposed is the best for all possible aircraft types and/or operations, since the future of aircraft development is far too vague for such concern."

Air Research's main objective, according to W. J. Patton, assistant to the president, was to develop both the heart and the muscle for a low pressure or high pressure system. This goal, set eight years ago, was realized in the development of the heart—the gas turbine compressor, and the muscle—the air turbine starter, or turbine motor and gas turbine motor.

■ Uniquely Air Research—Patton listed three in Air Research's unique contribution towards the development of practical, lightweight, efficient gas turbine power packages and motor units.

■ Forward-flow radial turbines. The short, heavily loaded radial compressor with straight blades, is responsible to a great extent for the efficiency and simplicity of Air Research's turbo auxiliary.

■ Variable-area nozzle. Fitting hand in glove with the 40-deg, forward-flow radial air turbine, the variable-area nozzle (or similar) feature is responsible in food and speed when a turbine machine is required to deliver constant power and/or constant speed (such as in drive as discussed).

Variations in industry load, caused by differences in inlet air temperature and pressure ratio, changes in altitude, etc., would impose severe operation restrictions on the equipment were the variable-area nozzle not available. The device allows the turbine to operate over an extremely broad range of inlet conditions with high efficiency, according to Air Research. Added highlight is the capacity of quick stopping and direct reversing by reversing the nozzle vane.

The new changing mechanism, which modulates speed and power out-



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pet at the turbine, say by two pistons or an intake valve, control is automatic.

AffResearch could still offer attributes of the variable nozzle principle. The turbine's compressor is raised only less than with the inlet throttle tip. Moreover, it has a high overall capacity as compared to an exhaust capacity for the inlet throttle sector since the throttle is wide open. The principle is applied only to the compressor air and gas turbine intake, not to the gas turbine.

AffResearch has developed two types of variable nozzles: the movable vane and the sliding ring.

Patrons and member of these features were original AffResearch developments. However, the firm is the first to apply their successfully to actual operating aircraft turbo machinery using a conventional fixed, beveled, disk.

**Turbine Highlights:** AffResearch engineers found that the 90 deg inward flow radial turbine was superior to the centrifugal blade turbine for many applications, especially where high peripheral velocity and stress become critical.

Wood pointed out that it is relatively simple to design and produce an engine which will easily compress air to 10:1 of turbine requirements. This air can be bled off to drive auxiliary equipment.

Wood stressed three operations, design and cost highlights of the AffResearch gas turbine compressor (GTC).

• **Backward curved wheel for compressor.** We have managed to achieve, in one design, higher efficiency with the backward curve compressor than is usually considered possible for an axial compressor," Wood said. Basic characteristics of the configuration is to provide a broad operating band in which the through flow can vary considerably while sustaining high efficiency. This is not true of the radial flow type of compressor, he said.

• **Wide gas turbine ambient temperature operating range from -65° to +115°.**

• **Adaptability of one basic component to a variety of jobs.** With only minor variations, the same unit may be used for either a bleed-off or shaft power compressor. (The first type furnishes power in the form of compressed air bled off the gas turbine, the second design power directly through a shaft.) Only slight required in a slight modification of the gas passage through flow vanes.

• **Ease of manufacture (and consequent lowering of price)** is assured because the turbine has a low number of blades, 12. These are straight, simplifying both even machining, is required. The exhaust is a separate unit.

• **Efficiency of the radial turbine is demonstrated by the fact that with a single stage, it can do a job equivalent to 12-2 stages of an axial flow turbine.** Wood stated.

• **Dual bleed extraction** is a unique feature of the turbine. Bleedback cool air (about 1500°) may be extracted from the chamber between the two stages, centrifugal compressor and the compressor. If hot air is required (about 1500°), it may be drawn off between the compressor and the turbine. A variety of both to give 600-900° is generally used.

Example of the last, as application is to drive an air starter. Considerable more power may be derived from the same amount of air to drive the starter if hot air is used, instead, most efficient with no increase in size or weight at power output.

Aside from the fact that the volume of these turbines is comparable with conventional production technology, Wood cited these additional advantages of AffResearch's turbine machinery.

• **Simplicity.** A single-stage radial turbine will handle most compressed air applications, avoiding the requirement for a large variety of turbine types. With single blade sections, the machine will handle even higher pressure ratios per stage than a centrifugal compressor.

• **Reliability.** Thousands of hours of actual operation have proven the reliability of the design. AffResearch offers a 100% production record of over 1000° at speeds of 46,000 rpm.

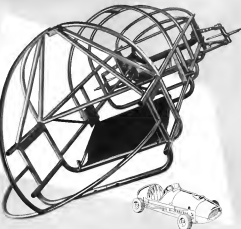
• **Low cost.** Large scale production, the advanced fixed inventory low cost by use of such manufacturing methods as precision cutting and lapping repeating file or no tooling machining.

Moreover, interchangeability of the machine's sub-components was stressed as a design feature to give high simplicity to maintenance crews. These components are designed as separate mechanical assemblies capable of interchange without work. The feature involves a slight weight penalty, but AffResearch feels the maintenance simplifications far outweigh this minor drawback.

• **Complete Package.** The engineering policy which dictated the final configuration of the GTC is wrapped it up in a standard-dimension envelope. Wood pointed out that the "molded design," bundling all components and controls of the GTC in a standard package, was done deliberately to avoid selling the customer basic units.

"Every maintenance technician will have his own (often serious) troubles. Why go through this for every airplane?" Wood asked. He contended that a gas turbine is very unexciting to its installation, in that by asking

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in a temperature-resistant envelope, the customer should certainly not require field service personnel. Standoff will be strong for the customer and AirResearch alike.

All packages are standard sized to the foot and 1/2, metal used at the other depends on the buyer.

The contents of AirResearch's complete nozzle in addition to the basic gas turbine, air starter, tachometer generator, fuel pump, oil tank and cooler, fan to ventilate hot end and hence air through the oil cooler, shaft governor, oil and fuel filters, ignition system, controls, and provision for CO<sub>2</sub> discharge in case of fire.

► **Highly Automatic**—The GTC package offers a high degree of automaticity. The unit is so rugged that a single flip of a switch will set the entire machine in operation. The turbine starts automatically. Automatic controls take over the job of governing the machine's operation, protecting it from excessive overloads and maintaining set point temperature. Wood believes that no other auxiliary power unit has attained such completely automatic self-sufficiency.

Fuel consumption of the GTC is roughly 80 lb per hr at test level.

► **Auxiliary**—AirResearch currently offers three thrust turbine units which can be driven by compressed air supplied by its GTC. And all the main engines, or both.

► **Air Turbine Starter (ATS189)**. Designed specifically for main gas turbine starting, this unit weighs only 17 lb, is rated at 15 hp.

► **Air Turbine Motor (ATM125)**. Quoting AirResearch engineers, "This unit is the first light application of the variable-area nozzle turbine which is modulated by an integral pneumatic control to maintain constant rpm."

Developed to drive a 50-kva auxiliary type alternator at a constant 6,000 rpm, irrespective of electrical loads or air power supply, the unit is capable of maintaining constant rpm from 75 to 190 lb. Normal output is 70 hp. The 150 hp overload capacity (when driven by main engine bleed air) indicates the potential and flexibility of the variable-area nozzle.

Weight of the entire unit, including controls and oil system is 57 lb.

► **Gas Turbine Motor (GTM125)**. This unit harness bleed air for additional horsepower. Introducing bleed air to the main turbine air intake, bleed stream the fan has access to reduce scroll induction losses to a minimum. Radiation from the housing helps to heat incoming bleed air for added efficiency.

The motor produces 125 hp at 6,000 rpm. Lubrication control and cooling systems are all self-contained. Total weight dry, is 84 1/2 lb.

AirResearch also manufactures an transportable ground gas turbine con-

pressor to supply compressed air gases and air transportable, in turbine motor powered boats, capable of producing 1,000-500 hp/hr.

Other models cannot be described by name of security limitations.

► **Pneumatic**—AirResearch asserts that pneumatic power is the only feasible single power source for supplying energy to all such major auxiliary loads as the aircraft air main engine starting, power for gas-turbine electrical, heating and air conditioning.

Flexibility of the pneumatic power source is illustrated by these facts: the accessory drives may derive their power either from main engine, auxiliary gas turbine compressor, or both.

The GTC is an in itself highly versatile. It may be used in a ground unit, completely self-contained, or in a variable volume state. As an airborne unit (either permanent or removable) it may be carried externally in a streamlined pod, internally in the wing, or fuselage, or as an integral installation in the plane. As an airborne unit, it makes the aircraft completely self-sufficient from the point of view of engine starting at isolated bases at which air-turbine, electrical and other auxiliary power.

► **GTC Applications**—AirResearch lists three among the main airborne and ground applications of GTC:

► **Main engine starting**. An extremely lightweight, reliable, and powerful device advantages tailored start and rapid stopping, soft torque characteristics, no initial shock loads and low overloading moment.

► **Electricity generation**. Lightness in weight, simplicity of motor and good constant speed characteristics measured these applications.

► **Ground air conditioning**. Air cycle refrigeration units, standard in most high-speed military aircraft, may be powered from the output of GTC to provide cockpit, cabin, radio and other compartments.

► **Ground heating**. Comfortable heat is provided in the aircraft bleed air. This may be augmented by passing bleed air through a turbine exhaust heat exchanger or by utilizing turbine exhaust heat and burning compressor bleed air. Used with a heat exchanger, the compressor is a lightweight, efficient combustion heater.

► **Testing power**. Quickly detachable units may be hung under wing to supply power for timing and engine starting during engine start-up. If GTC is released it is, and of accuracy power to takeoff.

► **Defrosting and preheating**. High flow output of GTC-powered multi-orifice heater speeds defrosting wing and tail surfaces and preheating engines in Arctic area.

Still other uses of the power supplied by the GTC are fog dispersal and rain

way lighting, smoke screen generation, aircraft heat and emergency shelter facilities, hospital tank refrigeration, power for portable, airborne heaters in air helicopters, ground cooker pressure steam shock.

The Garrett Corp.'s main Los Angeles plant is expected to turn out 50 million worth of products a month this year, while the newly opened Phoenix plant's output will soon reach 54 million. And a similar expansion of those totals will be turbo machinery.

## Stratos Units Go in BOAC Coach Connies

Stratos cabin superchargers, made by the Stratos division, Fairchild-Rogers



DISPATCH OFFICE communicates with his customer to learn status of plane.



## Radio Set-Up Relays Flight Status

A new method of keeping passengers informed about their flight status is a radio-relay installation set up at the operation by Capital Airlines at Wash. region (D.C.) International Airport, where the carrier's main terminal has a radio relay.

Capital officials told Aviation Week that the radio-relay set up is the first time of the kind, now in the formative stage, to make all its personal contacts of the passenger and to keep him constantly informed throughout his flight. With this two-way radio, a mechanic actually working on the aircraft can refer up to the radio relay station concerning his mechanical status to the flight dispatch office.

Another advantage of the radio-relay is that the mechanic can call the lounge for needed parts or tools instead of waiting for them.

Least included a permanent installation in the wing and door sets in the flight dispatch office and the main terminal one directly above. Two mobile land sets are provided for mechanics working on the planes.

The relay set operates from two 60-ampere batteries whose charge is permanently kept up by a transistor-controlled motor-generator charging unit. Desk units operate on 115-v ac current.

Sets have a 5-hr. output, giving them a 3-hr. stand-by, according to the radio. Operating on an assigned frequency of 154.57 megacycles, the FM sets use the VHF spectrum. Call letters are K4396.

Capital says this is the first time an industrial frequency has been allocated by the Federal Communications Commission for such a use.





## From the 'Birthplace of Phantom Shapes New Water-Based Weapons

Seaplane research is bringing new phantoms to life in Stevens Tech's towing tanks, testing ground for the U.S. Navy Martin's advanced hull design.



Definitely engineered models from Stevens Tech's towing tanks, testing ground for the U.S. Navy Martin's advanced hull design.

A maintenance-covered airplane model is being towed through the waters of a Stevens Tech towing tank. A Naval Bureau of Aeronautics researcher plans new plans for a jet-powered, wing-wing flying boat. A Martin engineer studies dynamic data wings on low-draging board. And, step by step, planes that would meet latest military with land-based speed come closer to reality.

Latest product of airplane research team work, today's advanced Martin B-14, Martin will now move to the Navy's air-operations facility. Their performance in the tradition of the history-making Martin seaplane flight at Catalina in 1917, the famous Martin China Clipper, the dramatic rescue of Marine patrol planes and the record-long-carrying Mars flying boats of World War II.

Today's airplane research promises to make their jet-powered successor tomorrow even more potent weapons in America's arsenal! The Glenn L. Martin Company, Baltimore 2, Maryland.

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Aircraft Division

DEVELOPERS AND MANUFACTURERS OF: Navy B-14, B-15, B-16, B-17, B-18, B-19, B-20, B-21, B-22, B-23, B-24, B-25, B-26, B-27, B-28, B-29, B-30, B-31, B-32, B-33, B-34, B-35, B-36, B-37, B-38, B-39, B-40, B-41, B-42, B-43, B-44, B-45, B-46, B-47, B-48, B-49, B-50, B-51, B-52, B-53, B-54, B-55, B-56, B-57, B-58, B-59, B-60, B-61, B-62, B-63, B-64, B-65, B-66, B-67, B-68, B-69, B-70, B-71, B-72, B-73, B-74, B-75, B-76, B-77, B-78, B-79, B-80, B-81, B-82, B-83, B-84, B-85, B-86, B-87, B-88, B-89, B-90, B-91, B-92, B-93, B-94, B-95, B-96, B-97, B-98, B-99, B-100, B-101, B-102, B-103, B-104, B-105, B-106, B-107, B-108, B-109, B-110, B-111, B-112, B-113, B-114, B-115, B-116, B-117, B-118, B-119, B-120, B-121, B-122, B-123, B-124, B-125, B-126, B-127, B-128, B-129, B-130, B-131, B-132, B-133, B-134, B-135, B-136, B-137, B-138, B-139, B-140, B-141, B-142, B-143, B-144, B-145, B-146, B-147, B-148, B-149, B-150, B-151, B-152, B-153, B-154, B-155, B-156, B-157, B-158, B-159, B-160, B-161, B-162, B-163, B-164, B-165, B-166, B-167, B-168, B-169, B-170, B-171, B-172, B-173, B-174, B-175, B-176, B-177, B-178, B-179, B-180, B-181, B-182, B-183, B-184, B-185, B-186, B-187, B-188, B-189, B-190, B-191, B-192, B-193, B-194, B-195, B-196, B-197, B-198, B-199, B-200, B-201, B-202, B-203, B-204, B-205, B-206, B-207, B-208, B-209, B-210, B-211, B-212, B-213, B-214, B-215, B-216, B-217, B-218, B-219, B-220, B-221, B-222, B-223, B-224, B-225, B-226, B-227, B-228, B-229, B-230, B-231, B-232, B-233, B-234, B-235, B-236, B-237, B-238, B-239, B-240, B-241, B-242, B-243, B-244, B-245, B-246, B-247, B-248, B-249, B-250, B-251, B-252, B-253, B-254, B-255, B-256, B-257, B-258, B-259, B-260, B-261, B-262, B-263, B-264, B-265, B-266, B-267, B-268, B-269, B-270, B-271, B-272, B-273, B-274, B-275, B-276, B-277, B-278, B-279, B-280, B-281, B-282, B-283, B-284, B-285, B-286, B-287, B-288, B-289, B-290, B-291, B-292, B-293, B-294, B-295, B-296, B-297, B-298, B-299, B-300, B-301, B-302, B-303, B-304, B-305, B-306, B-307, B-308, B-309, B-310, B-311, B-312, B-313, B-314, B-315, B-316, B-317, B-318, B-319, B-320, B-321, B-322, B-323, B-324, B-325, B-326, B-327, B-328, B-329, B-330, B-331, B-332, B-333, B-334, B-335, B-336, B-337, B-338, B-339, B-340, B-341, B-342, B-343, B-344, B-345, B-346, B-347, B-348, B-349, B-350, B-351, B-352, B-353, B-354, B-355, B-356, B-357, B-358, B-359, B-360, B-361, B-362, B-363, B-364, B-365, B-366, B-367, B-368, B-369, B-370, B-371, B-372, B-373, B-374, B-375, B-376, B-377, B-378, B-379, B-380, B-381, B-382, B-383, B-384, B-385, B-386, B-387, B-388, B-389, B-390, B-391, B-392, B-393, B-394, B-395, B-396, B-397, B-398, B-399, B-400, B-401, B-402, B-403, B-404, B-405, B-406, B-407, B-408, B-409, B-410, B-411, B-412, B-413, B-414, B-415, B-416, B-417, B-418, B-419, B-420, B-421, B-422, B-423, B-424, B-425, B-426, B-427, B-428, B-429, B-430, B-431, B-432, B-433, B-434, B-435, B-436, B-437, B-438, B-439, B-440, B-441, B-442, B-443, B-444, B-445, B-446, B-447, B-448, B-449, B-450, B-451, B-452, B-453, B-454, B-455, B-456, B-457, B-458, B-459, B-460, B-461, B-462, B-463, B-464, B-465, B-466, B-467, B-468, B-469, B-470, B-471, B-472, B-473, B-474, B-475, B-476, B-477, B-478, B-479, B-480, B-481, B-482, B-483, B-484, B-485, B-486, B-487, B-488, B-489, B-490, B-491, B-492, B-493, B-494, B-495, B-496, B-497, B-498, B-499, B-500, B-501, B-502, B-503, B-504, B-505, B-506, B-507, B-508, B-509, B-510, B-511, B-512, B-513, B-514, B-515, B-516, B-517, B-518, B-519, B-520, B-521, B-522, B-523, B-524, B-525, B-526, B-527, B-528, B-529, B-530, B-531, B-532, B-533, B-534, B-535, B-536, B-537, B-538, B-539, B-540, B-541, B-542, B-543, B-544, B-545, B-546, B-547, B-548, B-549, B-550, B-551, B-552, B-553, B-554, B-555, B-556, B-557, B-558, B-559, B-560, B-561, B-562, B-563, B-564, B-565, B-566, B-567, B-568, B-569, B-570, B-571, B-572, B-573, B-574, B-575, B-576, B-577, B-578, B-579, B-580, B-581, B-582, B-583, B-584, B-585, B-586, B-587, B-588, B-589, B-590, B-591, B-592, B-593, B-594, B-595, B-596, B-597, B-598, B-599, B-600, B-601, B-602, B-603, B-604, B-605, B-606, B-607, B-608, B-609, B-610, B-611, B-612, B-613, B-614, B-615, B-616, B-617, B-618, B-619, B-620, B-621, B-622, B-623, B-624, B-625, B-626, B-627, B-628, B-629, B-630, B-631, B-632, B-633, B-634, B-635, B-636, B-637, B-638, B-639, B-640, B-641, B-642, B-643, B-644, B-645, B-646, B-647, B-648, B-649, B-650, B-651, B-652, B-653, B-654, B-655, B-656, B-657, B-658, B-659, B-660, B-661, B-662, B-663, B-664, B-665, B-666, B-667, B-668, B-669, B-670, B-671, B-672, B-673, B-674, B-675, B-676, B-677, B-678, B-679, B-680, B-681, B-682, B-683, B-684, B-685, B-686, B-687, B-688, B-689, B-690, B-691, B-692, B-693, B-694, B-695, B-696, B-697, B-698, B-699, B-700, B-701, B-702, B-703, B-704, B-705, B-706, B-707, B-708, B-709, B-710, B-711, B-712, B-713, B-714, B-715, B-716, B-717, B-718, B-719, B-720, B-721, B-722, B-723, B-724, B-725, B-726, B-727, B-728, B-729, B-730, B-731, B-732, B-733, B-734, B-735, B-736, B-737, B-738, B-739, B-740, B-741, B-742, B-743, B-744, B-745, B-746, B-747, B-748, B-749, B-750, B-751, B-752, B-753, B-754, B-755, B-756, B-757, B-758, B-759, B-760, B-761, B-762, B-763, B-764, B-765, B-766, B-767, B-768, B-769, B-770, B-771, B-772, B-773, B-774, B-775, B-776, B-777, B-778, B-779, B-780, B-781, B-782, B-783, B-784, B-785, B-786, B-787, B-788, B-789, B-790, B-791, B-792, B-793, B-794, B-795, B-796, B-797, B-798, B-799, B-800, B-801, B-802, B-803, B-804, B-805, B-806, B-807, B-808, B-809, B-810, B-811, B-812, B-813, B-814, B-815, B-816, B-817, B-818, B-819, B-820, B-821, B-822, B-823, B-824, B-825, B-826, B-827, B-828, B-829, B-830, B-831, B-832, B-833, B-834, B-835, B-836, B-837, B-838, B-839, B-840, B-841, B-842, B-843, B-844, B-845, B-846, B-847, B-848, B-849, B-850, B-851, B-852, B-853, B-854, B-855, B-856, B-857, B-858, B-859, B-860, B-861, B-862, B-863, B-864, B-865, B-866, B-867, B-868, B-869, B-870, B-871, B-872, B-873, B-874, B-875, B-876, B-877, B-878, B-879, B-880, B-881, B-882, B-883, B-884, B-885, B-886, B-887, B-888, B-889, B-890, B-891, B-892, B-893, B-894, B-895, B-896, B-897, B-898, B-899, B-900, B-901, B-902, B-903, B-904, B-905, B-906, B-907, B-908, B-909, B-910, B-911, B-912, B-913, B-914, B-915, B-916, B-917, B-918, B-919, B-920, B-921, B-922, B-923, B-924, B-925, B-926, B-927, B-928, B-929, B-930, B-931, B-932, B-933, B-934, B-935, B-936, B-937, B-938, B-939, B-940, B-941, B-942, B-943, B-944, B-945, B-946, B-947, B-948, B-949, B-950, B-951, B-952, B-953, B-954, B-955, B-956, B-957, B-958, B-959, B-960, B-961, B-962, B-963, B-964, B-965, B-966, B-967, B-968, B-969, B-970, B-971, B-972, B-973, B-974, B-975, B-976, B-977, B-978, B-979, B-980, B-981, B-982, B-983, B-984, B-985, B-986, B-987, B-988, B-989, B-990, B-991, B-992, B-993, B-994, B-995, B-996, B-997, B-998, B-999, B-1000, B-1001, B-1002, B-1003, B-1004, B-1005, B-1006, B-1007, B-1008, B-1009, B-1010, B-1011, B-1012, B-1013, B-1014, B-1015, B-1016, B-1017, B-1018, B-1019, B-1020, B-1021, B-1022, B-1023, B-1024, B-1025, B-1026, B-1027, B-1028, B-1029, B-1030, B-1031, B-1032, B-1033, B-1034, B-1035, B-1036, B-1037, B-1038, B-1039, B-1040, B-1041, B-1042, B-1043, B-1044, B-1045, B-1046, B-1047, B-1048, B-1049, B-1050, B-1051, B-1052, B-1053, B-1054, B-1055, B-1056, B-1057, B-1058, B-1059, B-1060, B-1061, B-1062, B-1063, B-1064, B-1065, B-1066, B-1067, B-1068, B-1069, B-1070, B-1071, B-1072, B-1073, B-1074, B-1075, B-1076, B-1077, B-1078, B-1079, B-1080, B-1081, B-1082, B-1083, B-1084, B-1085, B-1086, B-1087, B-1088, B-1089, B-1090, B-1091, B-1092, B-1093, B-1094, B-1095, B-1096, B-1097, B-1098, B-1099, B-1100, B-1101, B-1102, B-1103, B-1104, B-1105, B-1106, B-1107, B-1108, B-1109, B-1110, B-1111, B-1112, B-1113, B-1114, B-1115, B-1116, B-1117, B-1118, B-1119, B-1120, B-1121, B-1122, B-1123, B-1124, B-1125, B-1126, B-1127, B-1128, B-1129, B-1130, B-1131, B-1132, B-1133, B-1134, B-1135, B-1136, B-1137, B-1138, B-1139, B-1140, B-1141, B-1142, B-1143, B-1144, B-1145, B-1146, B-1147, B-1148, B-1149, B-1150, B-1151, B-1152, B-1153, B-1154, B-1155, B-1156, B-1157, B-1158, B-1159, B-1160, B-1161, B-1162, B-1163, B-1164, B-1165, B-1166, B-1167, B-1168, B-1169, B-1170, B-1171, B-1172, B-1173, B-1174, B-1175, B-1176, B-1177, B-1178, B-1179, B-1180, B-1181, B-1182, B-1183, B-1184, B-1185, B-1186, B-1187, B-1188, B-1189, B-1190, B-1191, B-1192, B-1193, B-1194, B-1195, B-1196, B-1197, B-1198, B-1199, B-1200, B-1201, B-1202, B-1203, B-1204, B-1205, B-1206, B-1207, B-1208, B-1209, B-1210, B-1211, B-1212, B-1213, B-1214, B-1215, B-1216, B-1217, B-1218, B-1219, B-1220, B-1221, B-1222, B-1223, B-1224, B-1225, B-1226, B-1227, B-1228, B-1229, B-1230, B-1231, B-1232, B-1233, B-1234, B-1235, B-1236, B-1237, B-1238, B-1239, B-1240, B-1241, B-1242, B-1243, B-1244, B-1245, B-1246, B-1247, B-1248, B-1249, B-1250, B-1251, B-1252, B-1253, B-1254, B-1255, B-1256, B-1257, B-1258, B-1259, B-1260, B-1261, B-1262, B-1263, B-1264, B-1265, B-1266, B-1267, B-1268, B-1269, B-1270, B-1271, B-1272, B-1273, B-1274, B-1275, B-1276, B-1277, B-1278, B-1279, B-1280, B-1281, B-1282, B-1283, B-1284, B-1285, B-1286, B-1287, B-1288, B-1289, B-1290, B-1291, B-1292, B-1293, B-1294, B-1295, B-1296, B-1297, B-1298, B-1299, B-1300, B-1301, B-1302, B-1303, B-1304, B-1305, B-1306, B-1307, B-1308, B-1309, B-1310, B-1311, B-1312, B-1313, B-1314, B-1315, B-1316, B-1317, B-1318, B-1319, B-1320, B-1321, B-1322, B-1323, B-1324, B-1325, B-1326, B-1327, B-1328, B-1329, B-1330, B-1331, B-1332, B-1333, B-1334, B-1335, B-1336, B-1337, B-1338, B-1339, B-1340, B-1341, B-1342, B-1343, B-1344, B-1345, B-1346, B-1347, B-1348, B-1349, B-1350, B-1351, B-1352, B-1353, B-1354, B-1355, B-1356, B-1357, B-1358, B-1359, B-1360, B-1361, B-1362, B-1363, B-1364, B-1365, B-1366, B-1367, B-1368, B-1369, B-1370, B-1371, B-1372, B-1373, B-1374, B-1375, B-1376, B-1377, B-1378, B-1379, B-1380, B-1381, B-1382, B-1383, B-1384, B-1385, B-1386, B-1387, B-1388, B-1389, B-1390, B-1391, B-1392, B-1393, B-1394, B-1395, B-1396, B-1397, B-1398, B-1399, B-1400, B-1401, B-1402, B-1403, B-1404, B-1405, B-1406, B-1407, B-1408, B-1409, B-1410, B-1411, B-1412, B-1413, B-1414, B-1415, B-1416, B-1417, B-1418, B-1419, B-1420, B-1421, B-1422, B-1423, B-1424, B-1425, B-1426, B-1427, B-1428, B-1429, B-1430, B-1431, B-1432, B-1433, B-1434, B-1435, B-1436, B-1437, B-1438, B-1439, B-1440, B-1441, B-1442, B-1443, B-1444, B-1445, B-1446, B-1447, B-1448, B-1449, B-1450, B-1451, B-1452, B-1453, B-1454, B-1455, B-1456, B-1457, B-1458, B-1459, B-1460, B-1461, B-1462, B-1463, B-1464, B-1465, B-1466, B-1467, B-1468, B-1469, B-1470, B-1471, B-1472, B-1473, B-1474, B-1475, B-1476, B-1477, B-1478, B-1479, B-1480, B-1481, B-1482, B-1483, B-1484, B-1485, B-1486, B-1487, B-1488, B-1489, B-1490, B-1491, B-1492, B-1493, B-1494, B-1495, B-1496, B-1497, B-1498, B-1499, B-1500, B-1501, B-1502, B-1503, B-1504, B-1505, B-1506, B-1507, B-1508, B-1509, B-1510, B-1511, B-1512, B-1513, B-1514, B-1515, B-1516, B-1517, B-1518, B-1519, B-1520, B-1521, B-1522, B-1523, B-1524, B-1525, B-1526, B-1527, B-1528, B-1529, B-1530, B-1531, B-1532, B-1533, B-1534, B-1535, B-1536, B-1537, B-1538, B-1539, B-1540, B-1541, B-1542, B-1543, B-1544, B-1545, B-1546, B-1547, B-1548, B-1549, B-1550, B-1551, B-1552, B-1553, B-1554, B-1555, B-1556, B-1557, B-1558, B-1559, B-1560, B-1561, B-1562, B-1563, B-1564, B-1565, B-1566, B-1567, B-1568, B-1569, B-1570, B-1571, B-1572, B-1573, B-1574, B-1575, B-1576, B-1577, B-1578, B-1579, B-1580, B-1581, B-1582, B-1583, B-1584, B-1585, B-1586, B-1587, B-1588, B-1589, B-1590, B-1591, B-1592, B-1593, B-1594, B-1595, B-1596, B-1597, B-1598, B-1599, B-1600, B-1601, B-1602, B-1603, B-1604, B-1605, B-1606, B-1607, B-1608, B-1609, B-1610, B-1611, B-1612, B-1613, B-1614, B-1615, B-1616, B-1617, B-1618, B-1619, B-1620, B-1621, B-1622, B-1623, B-1624, B-1625, B-1626, B-1627, B-1628, B-1629, B-1630, B-1631, B-1632, B-1633, B-1634, B-1635, B-1636, B-1637, B-1638, B-1639, B-1640, B-1641, B-1642, B-1643, B-1644, B-1645, B-1646, B-1647, B-1648, B-1649, B-1650, B-1651, B-1652, B-1653, B-1654, B-1655, B-1656, B-1657, B-1658, B-1659, B-1660, B-1661, B-1662, B-1663, B-1664, B-1665, B-1666, B-1667, B-1668, B-1669, B-1670, B-1671, B-1672, B-1673, B-1674, B-1675, B-1676, B-1677, B-1678, B-1679, B-1680, B-1681, B-1682, B-1683, B-1684, B-1685, B-1686, B-1687, B-1688, B-1689, B-1690, B-1691, B-1692, B-1693, B-1694, B-1695, B-1696, B-1697, B-1698, B-1699, B-1700, B-1701, B-1702, B-1703, B-1704, B-1705, B-1706, B-1707, B-1708, B-1709, B-1710, B-1711, B-1712, B-1713, B-1714, B-1715, B-1716, B-1717, B-1718, B-1719, B-1720, B-1721, B-1722, B-1723, B-1724, B-1725, B-1726, B-1727, B-1728, B-1729, B-1730, B-1731, B-1732, B-1733, B-1734, B-1735, B-1736, B-1737, B-1738, B-1739, B-1740, B-1741, B-1742, B-1743, B-1744, B-1745, B-1746, B-1747, B-1748, B-1749, B-1750, B-1751, B-1752, B-1753, B-1754, B-1755, B-1756, B-1757, B-1758, B-1759, B-1760, B-1761, B-1762, B-1763, B-1764, B-1765, B-1766, B-1767, 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# HOW TO HELP BRITAIN ...and Ourselves

The purpose of this editorial is to help Winston Churchill obtain the aid Britain needs

- (1) to weather her present financial crisis, and
- (2) to avoid a chronic recurrence of such crisis.

This is not a philanthropic purpose.

Britain is our staunchest ally in the free world's continuing fight for survival. She cannot perform her role effectively if she is broke, or if she careens from one financial crisis to another.

Then, too, a nation such as ours—committed to private enterprise as a way of economic life—has a special interest in helping Winston Churchill to help Britain. His administration is relatively friendly toward private enterprise. Should he fail, he would be replaced promptly by a Socialist government more hostile than ever. And that would weaken the standing of private enterprise in the free world.

### Cause of the Crisis

It is the drive of the Western World under our leadership to rearm against Russian aggression that has precipitated Britain's financial crisis. It set off a scramble for raw materials from which armaments could be made, and for many other materials that might be

short in the event of war. So the prices of the things that Britain must import—mostly raw materials—have been boosted more than the prices of things she can export—mostly finished products. That leaves Britain short of funds to pay for essential imports. This difficulty increases as the necessity becomes more urgent to divert industrial effort from production for export to production for security.

### The Basic Trouble

Although Britain's immediate crisis was touched off by the rearmament drive of the Western World, her basic affliction is one from which she has suffered since the end of World War I. Stated in its simplest terms, Britain does not produce enough goods to pay her own way as one of the family of free nations.

For years this deficiency in home production was made up by income from shipping and overseas investment. But Britain had to sell a large part of her foreign investments to finance her heroic part in World War I. So her income from that source has been greatly reduced. And, in spite of an increase of about a third above prewar in her own production of goods and—thanks to a continued "wasteful" program—a much larger increase in her exports, Britain still is not paying her own way.



## Two Ways to Solvency

Britain has two ways to restore her solvency. One is to cut down on what is consumed—the belt-tightening process. The other is to step up British production.

To surmount the present crisis, Mr. Churchill has asked for some cutting down. He probably must ask for more.

Except as a stop-gap expedient, however, more cutting down of Britain's consumption is clearly a dangerous course. That would further depress a British standard of living which, not more than half so high as ours, already is too low. Politically such a course would grease the skids for Winston Churchill's administration, even now governing by a wider-than-parliamentary margin. Also, as *The (London) Economist* remarks, the "icy expedient of cutting trade" would result in "hurting other people and forcing them to take similar action"—by cutting the market for their products.

## The Only Cure

The best and, in fact, the only way to help cure Britain's economic ills is to help Britain produce more. Here the technical possibilities are encouraging. On the average, the British industrial worker produces only about 40 percent as much a year as the American worker. That is a British estimate, made by Sir Ewart Smith.

Wider use of better industrial methods and modern tools and an infusion of the competitive incentive into British industry—to replace the curial and other restrictive practices—would go a long way to narrow this wide gap in worker productivity. This is the consensus of experts on both sides of the Atlantic.

Since 1948 the Anglo-American Council on Productivity has done much to encourage output per man-hour in Britain and to foster this doctrine with both labor and management. But much yet remains to be done.

In the United States it is increasingly sug-

gested that before we give Britain any more economic aid we should start that everything possible be done to exploit the technical possibilities of increased production. This emphasis on production is needed. But if we Americans were to impose upon the hard-pressed British people conditions that could be construed as an affront to a friendly and sovereign nation, we might well put into the hands of a masterful rubble-raiser such as Aneurin Bevan, the anti-American leader of the Labor Party's left wing, a campaign issue on which to maneuver himself into the Prime Ministership.

## Churchill Con Insist

But Winston Churchill is not so handicapped as we should be an imposing prevaricator of further aid. As Britain's own, most honored leader he will raise no touchy questions as to Anglo-American relations if he insists that Britain have firm plans to cure her economic ills, plans sharply focused on wages and means of increasing Britain's industrial efficiency.

By presenting a convincing plan to cure Britain's recurring crises through greater production, Mr. Churchill will greatly facilitate the process of getting the aid his country must have. He will also remove an increasingly dangerous element of dissension in Anglo-American relations—the feeling of many Americans that more aid to Britain is more money down the drain. The way to counter that feeling is to come up with a prescription for an economic cure, not a request for another economic poultice.

Technically, such a program is entirely feasible. It will perhaps be the supreme test of Winston Churchill's statesmanship to make it politically feasible as well.

In the interest of Britain, of the United States and of the whole free world, we wish him all success.

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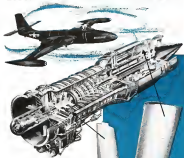


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## AIR TRANSPORT

# CAB-Airline Clash Brews on Coach Fares

- Board wants less than 4½ cents per mile day rate and 4 cents or less for night coaches.
- But companies operating non-competitive routes may oppose any reduction in established fares.

By F. Lee Moore

A potential controversy is brewing between some airlines and Civil Aeronautics Board (CAB) over CAB's plan to slash on a coach fare cut from the present 14 cents a mile to 4 cents or less on night coach.

CAB expects all the airlines to accept coach fare reductions by Mar. 1, effective Apr. 1, which would raise the present 14 cents a mile to 4 cents or less on night coach, to 4 cents or less on night coach.

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one to the fare differential on type transport and apparently unwilling to let the DC-4 fare from American and TWA to lower their already filed DC-6 and Constellation fare from \$12.

So intercontinental coach fares have been set at \$99, with \$12 between New York and Chicago. CAB has shown it will meet coach fare competition to some extent, as well as lower high fares down where competition doesn't force them down substantially.

So competition the key to whether airlines voluntarily reduce coach fares or not. Do competitive routes, and more of the competition is likely to follow the CAB fare cut policy, bringing in competition down to the lower fare with him.

But on non-competitive routes, some airlines may decide to protect the CAB policy. That's the question the airlines are trying to resolve now. Owners probably don't know the answer long before Mar. 1—deadline for renewal applications on air coach rates.

■ **Competition Is Key—Meanwhile, Eastern Air Lines is debating on its National's proposed fare cut from \$12 to \$91 New York-Miami, for both night and day coach. What is \$91 cents a mile non-stop, would be around 14 cents a mile with the usual intermediate stops.**

Then compare with the present 14 to 4½-cent fare.

The again demonstrates that CAB is probably not going to have any true big getting airlines to cut fares on the short-haul coach routes. Here is why the CAB wants over that possible prospect.

A top CAB official says the success of a fare reduction depends largely on competition and what effect just into it by the airline. If that the transport to near capacity (say, 60-85%) on a scheduled flight is the chief requirement of success of a coach fare. CAB is anxious to have the airlines cut the fare with such substantial penalties, where no airline doesn't do this, some from the service can turn out a money loser.

One official says United's New York San Francisco coach "experiment"

as an example. United started it to "study" CAB and charges the passenger who doesn't a coach flight the same cost as his ticket if he doesn't permit his ticket for refund within three hours before plane time, while competitor TWA doesn't charge on transfers anything for failure to make a flight. One possible result of this type competition is that TWA's New York-San Francisco DC-4 has assigned 44 passengers per flight since its start Oct. 1. United's has averaged 37 passengers.

MIA vs. United New York-San Francisco coach competition their first three months stands up that way, on load factors October, November, and December, with United flying 66-passenger DC-4s and TWA 60-passenger DC-4s.

• TWA 67%, 72%, and 60%.  
• United 52%, 51%, and 54%.

But observers point out that United is not getting started in the intercontinental coach market.

■ **Coach Expenses—Meanwhile, equipment ownership to coach density is the chief problem of airlines as planning air coach expansion—only owned by the CAB policy. An American Airlines official points out that an airline has to take a plane out of service about two weeks to convert it to coach status.**

By ending its doubling of two continental service by June, American has had to take a New York-Boston flight temporarily, causing not only revenue loss but savings from the area affected.

Another example is National's DC-4 conversion program. National Airlines this month will start production planning problems on converting 14 to DC-4 to 60-passenger coaches. National had asked CAB permission to start 15 New York-Miami coach service by Feb. 1, but because CAB refused to give advance notice whether it would approve or not. National says it has no idea if it must ditch the new coach service to May 1 or May 15.

Meanwhile, Pan American has solved the conversion problem by ordering a whole new air coach fleet of 20 DC-6B transports down from the Douglas factory. First ones are expected by time to start trans-Atlantic coach service May 1, without a hitch in current scheduling. The rest will come along in later 1952 and 1953.

■ **CAB Urges Short-haul Coach, Too—Short-haul coach is CAB's next project.**



me that the domestic airlines are, with good reason, not as much expansion, and that American has gone off the air as from Atlantic coach plane.

In American Airlines official was almost even then, he tells me CAB people they ask him "when are you going to start a short haul coach about it?"

And Consolidated Vertigo, co-owner, then skip in design studies of new add-on coach configuration. Consolidated on 14 or 16 40-65 passengers on short hauls.

They are even considering putting the Wright 3500 engine on them to haul the heavier load. They claim

the problem is going to be, how load, not square feet of floor space. They get considerable added space by sinking the galleys and the baggage racks.

▶ All-Czech Airlines-Danish high CAB official has told Airtransport Wines he would like to see one of the smaller airlines convert its entire fleet of post-war planes to air coach seating. He made the following points in favor of such a program:

- Smaller airlines get into that status too problems when they have part of their planes coach and part tourist. Its hard to get scheduling flexibility that way.
- Smaller airlines have shorter routes,

so short-hauls, passengers don't need first-class and other personalized service, and they don't need much leg room or lounge space. Service and leg room are the chief difficulties between coach and luxury (stand-aid) transport.

However, he says, who not convert an entire fleet that to coach, thereby, losing many people and broadening the passenger base of the airline's passenger.

## Senate Committee Hints Air Coach Policy

SENATE'S Small Business Committee deprives Civil Aeronautics Board's plan to let the scheduled airlines do, flying air coach-and is going to keep flying air.

In its annual report just released, the committee commented on CAB's air coach meeting with scheduled airline representatives.

Those who had presented coach travel were not in the Board's plan for expanded coach service. In fact, the Board's apparent policy was to drive the independent carriers out of business through economic measures since it had failed to eliminate them through regulation.

▶ Cities UAL Case? The head of one of the major airlines, W. A. Patterson of United, under this strategy, that is recommending that United would offer coach-to-coast air coach service for \$50, cut below and 500 seatboard. United's full transportation fare is \$197.85. In coach flight, suggested only, in September 1958 has been changing \$4.10. If due to coach, how drop their fares any lower, we'll go right down the scale, dollar for dollar, with them." He later stated that he would not be going into the air coach business if it was not for "political reasons."

It's a "clear example," the committee said, of "a government agency interfering the natural economic forces at work and eliminating the opportunity for new enterprises to come into the field by subsidizing in effect a new product or service."

▶ Carriers' Reluctant-Partnership: The committee is worried there will be, any "subsidized" increase in coach service by the large certificated carriers. "Existing equipment is in full use. New equipment will mean a long wait. Airlines officials have expressed private reluctance to convert existing planes into coach type planes."

Heads know the fact that the gas prices will not provide in the immediate future the government low-cost aviation the committee is concerned with the more fundamental problems of the usual gain of a potential monopoly to the existing large carriers of air new development in air transportation. —

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## More Flight Aids

- Better code, more voice identifiers are planned.
- But expenses involved will delay program.

The CAA with Air Transport Association, is testing out a two-phase program to improve identification of navigation aids, instrument landing systems, fire markers and compass locators.

First, the code identification of the transmitters is to be made distinguishable from other aids. Second, a step-up in installation of voice identifiers beside the code identifiers is planned, but promises to be long and expensive. However, authorities agree the change should be made, as all sets of an aid now extend the same identifier. Plans have occasionally flown one type and believing it to be another.

- Code. Here's the current program on Code Identifier Requirements.
- VOR ranges. CAA is adding a "V" — to the code identifier letter of VOR ranges. Thus, Largo AD will now be VLOD instead of just LOD.
- Instrument landing system. No one all plan is based on ILS identifier change yet, but CAA is adding the letter "I" to alphanumeric letter of ILS identifiers in each region respectively, at Memphis, Chicago

Duland, Kansas City, Los Angeles and Salt Lake.

- Fan markers. CAA is experimenting with new design for the fan code aid used to indicate the two types of runway more distinct. As they are new, the periodically unaided one-to-one clarity of one fan is as usual like the fan aid clarity of the other.
- Voice. Here's the plan to date for the more expensive program for adding voice identifiers to the regular code identifier.

• VOR ranges. The old CAA budgeted program was for 45 stations to be installed with fiscal 1970 and 1971 funds. But only a few have been installed to date. Voice identifiers, because the approach came through late and decisions are delayed also by the cost. Larry Beech, Oakland, Salt Lake City, Boston, and Caldwell, N.J., now have voice identifiers. The rest of the 40 may be in by June 30.

All new VOR ranges planned or recently and three to be purchased from now on will also have voice identifiers. The remaining 100-odd ranges will be converted in funds come through. Cost per aid for adding voice to existing aids is around \$1,000-4,000 each, but CAA and the airlines feel that cost will be a cheaper system than the Collins new cost.

- Fan markers. Plans to convert 19 fan ILS by June 30 may be, extended later. Airlines and the airlines agree CAA to divert enough additional funds from other 1971 CAA projects to install 20 more voice identifiers at fan markers in congested areas.



CAR GIVES FACTS IN ELIZABETH C-46 CRASH

Robert W. Doff, president general manager at Mass Airlines (third from left) today before panel of CAB Bureau of Safety Investigation committee set in the Elizabeth Federal District, N. J., on the crash of a Mass C-46 Comstock, Dec. 30, which killed 34. Left to right: E. N. Townsend, chief, technical division; J. G. Flatt, chief of Region 1; N. Y. Doff; R. W. Gray, pending official, chief, hearing and reports division; H. G. Cowley, principal reports writer, hearing and reports division; Doug Snyder, and CAB Executive Director James M. Verner, who came up subsequently from

Washington to attend the hearing. Other panel representatives: W. R. Andrews, director, Bureau of Safety Investigation, a unit included in this photo. Some 50 witnesses were heard during the two-day hearing. A probable cause of the crash was a failure in the bottom, forward cylinder in the right engine, resulting in an instant fire, which now has caused wing spurs to bend sufficiently to seriously affect control of plane. It is believed the C-46 was loaded close to its 45,000-lb allowable gross weight and as wing down may have helped trying to return to Newark Airport.

- Three are already operating near La Jolla, New Rochelle and Sebring.
- Canyon locations. Voice identifier is planned for canyon marker systems near locations: LaGuardia and Los Angeles are already operating.
- Problems—Money is the budget problem in the voice identifier program. But there are some costly technical problems too.

Mobilization of the voice identifier of some stations makes the cockpit's middle and rear marker lights flicker. Another attack on this problem is to get a more efficient design of the aid in use. To affect the marker lights. But the cost with the word search for identity of the particular marker, so different users sometimes have to be used. The FAA is working with the airlines and Collins Radio are experimenting with these problems and expect to solve them without much trouble.

## Muffler Preview Indicates Noise Cut

A preview demonstration last week at Teterboro Air Terminal at Anna Sneyd's voice identifier for last month's indicated that the Brooklyn manufacturer's cost may do a good job in cutting plane noise (Aviation Week Dec. 19-21).

Congressmen and Washington Civil Aeronautics Administration officials who witnessed the demonstration noted that the device did apparently reduce the operating noise level.

Albert Fier, a CAA observer, felt there was a decided cut in noise, especially at takeoff and when the plane started to climb, two points where noise is usually greatest. Fier said that "actual" burdens of the noise were considerably reduced, and vibration on the body was lessened.

• Double Roadways—Total plane noise at climb was reduced 50%, on the hour of readings from a double meter on the ground, New York Test Laboratories told Aviation Week. The system at that time was presented at the device station by Aero Research.

R. G. Baker of New York Testing Labs says there is evidence that the muffler has "a certain damping effect" damping out frequencies that cause people the most discomfort. There are the frequencies, Baker says, that penetrate the walls of houses most easily.

• Motor's Part—The two C-46s used in the test were provided by Mass Air Transport, an airplane-passenger contract carrier based at Teterboro. The two planes flew over at 3,000 ft altitude with engine controls at full power (idle). The flight was permitted by Port & Waterside, R. 2500. CAA agents flew in both planes to make over operating conditions were the same.

The modified plane had square-tipped prop blades, generally considered to be quietest form of propeller blades, and as those mounted on the unmodified plane. Motors could not get identical prop in both planes in time for the preview. But observers felt most of the credit for the quieter operation was due to the use of the muffler.

A full-scale demonstration was slated later in the week for school assemblies, writing groups, civic relations, cost studies, representatives of the armed services and of various government agencies.

## DPA Paves Way For Tax Write-Offs

Airlines applications for rapid tax write-off certificates for plants and spare parts will now get priority, handling Dept. Production Administration has announced.

And American and TWA already had received the first tax write-off certificates granted by DPA for aircraft.

These two DPA actions give the way for all air carriers to save some money on new equipment through accelerated tax amortization.

• Two Weeks' Notice—The DPA has ruled on which system of priority processing of tax write-off applications by defense and defense supporting industries. It has listed 14 priority rules items, including an aircraft, whose applications shall be processed first, special but equal speed.

Also, DPA says it will soon start inspecting regulations for granting tax amortization. DPA will give two weeks

notice before making the new regulations effective.

An official observer says that after a second meeting with DPA on his write-off applications, he got the impression that airline applications now before DPA would be processed by the end of the month.

• The Result—The American Airlines application for accelerated amortization on five Constellation was the first airline application acted upon, as was reported in industry news. DPA granted rapid write-off for 50% of the total cost amount of \$2,603,914. American applied for \$2,611,630.

The Trans World Airlines Kansas City office last week was notified that on its last application, covering over \$70 million in planes and spares, DPA granted an advance payment and spare parts account before Sept. 23, 1959-1960, except for 25% of spares deemed completely obsolete and spares acquired thereafter—50%.

## Fuel Aid Is Claimed From New Catalyst

A synthetically compounded catalyst composed of entirely synthetic materials and cast in the cylinder head of an internal combustion engine was described last week by its Russian-born inventor, Dr. Sophia Bolshakov, in a paper being given before a group of experts on engine performance.

Dr. Bolshakov said tests "have demonstrated improved performance of gas-turbine equivalent of up to 25 percent" in the engine's output, he said, and the catalyst also promotes more complete combustion, according

to the meeting, and includes formation of carbon deposits.

• Chemical—Reaction to increase amount of Dr. Bolshakov's discovery ranged from incredulity to skepticism. Some took up in the field questioned whether the product could perform all the claims claimed for it, without the signs of heat and pressure inside a combustion chamber, and various other factors as applicable length of time in the face of attack by such destructive agents as sulfur and other deleterious vapors which always present in a combustion chamber.

But Robert S. Wolfach, President of Associated Development and Research Corp., 150 Broadway, New York, which sponsored the grand conference at which the claims were made, and tests in C.F.R. (anti-knock) test engines had been conducted over a year's period and tested about 1,000 hr. running time.

The synthetic catalyst positively reacts on the fuel-air mixture when it enters the combustion chamber, with some properties promoting "complete" burn of combustion while others retard the combustion rate and thus prevent knock. Still others are included to take care of particular reactions in gas-turbine of different configurations.

• Life and Cost—Wolfach told the life of the catalyst could be expected to exceed that of the original catalyst. It is to be used in the engine as an average auto-catalytic engine, he estimated, would cost between \$30 and \$40, the cost of the catalyst itself being a nominal \$1. No critical tests are required in the catalyst's output, he said, and the primary ingredients used in it being whatever oil is used.



THIS IS HOW THE DOUGLAS DC-7 WILL LOOK

Though Aerojet Co. DC-7 will look much like the DC-6, according to the nation's airports, just released. Compared to the DC-6, it will look like the DC-6, according to the nation's airports, just released. Compared to the DC-6, it will look like the DC-6, according to the nation's airports, just released.

Weight Turbo Compound R-3500 engines. They will be four-blade Hamilton Standard units with diameter of 19 in. Douglas says the DC-7 is eight feet longer than the DC-6, and has a maximum gross weight of 25,000 lb, or 55 in its dash section.











## THE BRUNSWICK-BALKE-COLLENDER CO.

Beginning its 100th anniversary year of operation, Brunswick is now partially converting to the manufacture of airborne components. It has three openings in its permanent organization for qualified men.

- **AIRCRAFT PRODUCTION COORDINATOR** . . . Man with production or industrial engineering background, i.e., an M.E. degree, and some administrative experience to work in a staff position for manufacturing vice president in coordinate master planning, customer liaison, engineering and production. Must have aircraft manufacturing background.
- **SENIOR PROCESS PLANNER (AIRFRAME)** . . . Engineer with experience in tool and process planning for airframe to plan projects, put projects in work, direct method studies. Sheet metal experience particularly desirable.
- **PRODUCTION SUPERVISOR** . . . Man with minimum three years' experience in assembly and fabrication of airborne components. Must be able to give direction to other supervisors.

Plant is located in community of 100,000 on beautiful eastern shore of Lake Michigan. Good income of background, no experience, to Technical Placement Supervisor, Menasha, Michigan.

*Brunswick*



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General opportunities for aerodynamic and structural work.

Those who analyze complex problems and develop them in advanced military aircraft and space vehicles including guided missiles.

Available positions include:

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Location: located in Southern California. General aviation for civil engineers. Write today for complete information on these exciting job opportunities. Please forward copies of our magazine and resume. Address: Supply to Director of Engineering.

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### STRESS ANALYST GROUP LEADER

To coordinate and supervise the activities of a Stress Analyst Group assigned to solving the most complex analytical problems encountered in the design and development of Rocket Engine. Planning and directing literature surveys and studies including the application of mechanical physics and advanced principles of mechanics, fluid mechanics, thermodynamics, aerodynamics, and stress analysis to engineering problems concerned with the design and development of Rocket Engines.

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For more than half a century our organization located in the New York Metropolitan area has been closely connected with engineering problems in the field of power & chemistry.

#### MANY EMPLOYEE BENEFITS

Write giving resume of your background including age, education, experience, salary. Personal interview arranged at your convenience. Box AM 727, 821 W. 40 St., N. Y. 18, N. Y.



### Needed Now! Structures Engineers

Engineers in all fields of aerospace—civil, military, and space.

### Aerodynamic Dynamics Engineers

Two or more years of experience in aerodynamic, aerodynamic, and structural analysis.

• Master has the greatest variety of aerospace engineering problems in the field of general engineering, many positions are available in the field of general engineering, many positions are available in the field of general engineering, many positions are available in the field of general engineering.

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### PRECISION INSTRUMENT PLANT

Position now available for highly skilled personnel in the field of electronic control equipment.

### MECHANICAL DESIGN ENGINEERS

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## DESIGNERS DRAFTSMEN CHECKERS LOFTSMEN

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Good Year Aircraft Corporation, one of the oldest aircraft development organizations in the field, now offers unusual opportunities to engineers, both experienced and recent graduates, in all branches of aircraft design and development.

In addition to manufacturing airplanes and missiles, Good Year Aircraft builds a number of vital aircraft components as well as engine nacelles, outer and inner material for the fuselage program. The diversification of products, beyond purely defense needs at Good Year Aircraft, has resulted in an unusually wide and progressive experience throughout past years.

Selected positions with accompanying liberal employee benefits and bonus for extended work week are open to:

AERONAUTICAL  
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ENGINEERS

### DESIGN AND DEVELOPMENT

AIR FRAME STRUCTURE  
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ELECTRONIC AND ELECTRICAL SYSTEMS  
WHEELS AND BRAKES  
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Personnel are needed in the following classifications:

DESIGNERS  
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Previous experience and formal education desirable. However, applicants without formal education but with equivalent practical experience in other engineering fields will be given consideration.

You are invited to investigate these opportunities by submitting a resume of your qualifications and experience or by directly sending for our application which will be given prompt and serious consideration.

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Mr. C. G. Jones, Salary Personnel Department

**GOOD YEAR**  
**AIRCRAFT CORPORATION**  
ATLANTA 15, GEORGIA











## LETTERS

### Scare Headlines

The ink, long since well and dry at *Editor & Publisher* Dec. 29 is that of a number one of someone wanting all as a subject of which he is obviously opposed.

The Detroit Times was not far off in its handling of the two stories related to, and I suggest that you consider the following letter is a confession of the matter.

• The most about the local student in charged a making which was about was quite unusual and unusual, and probably was witnessed by several thousands of persons. Everybody in Detroit and that also was reported in the British student who related these lines and last.

We had a reader think never here and when the story plus related with the very last, and the newspaper on a picture and story on the front page the following day, the picture was very angry and took me to task. He wanted to know why the truth itself bigger plus than his advance picture, more on the of those which interests had been put in a magazine. My answer was that he ought to divide his time in getting his newspaper for the present or say such outside their office, then complaining of the error.

No the student related ought to police stick and put three British students, rather than spend money trying of "sensation" in newspaper job.

• The mad accident story is simply a stylized read-up story on Lake Erie work and fatalities. There is nothing of a personal-experience matter about it, being in other to the reader. Additionally, the change in the headlines is shameful and when it reaches their proprietors (which is that of some local "circulation" it is a big story. It was so played on this morning. Now let's suppose 495 persons had gone down on a Marine Corps boat in that event, the life of us men here in any accident certainly would have been played for about the get on news. Two months later that one would be "Market news, but it is true. Without the recent big case of interest in Illinois. It was played as big as any airplane story in most newspapers. I know it was so, even though the last we are far from the news.

In the God of Wing, most of the reader over it or not the case, and this makes a big difference in evaluating the news value.

Your ad reminds me of *Airline World's* letter at newspapers some two years ago when a remarkably honest story (about as well known as General Clark landed a small ship in the middle of a conference) was in *Los Angeles*. He told out of his point and was told in his head struck the wing.

Newspapers the industry were rightly played this story as a big way, not because a plane was involved, but for other reasons, the chief one being the sugar that was a

popular favorite and his death under any circumstances was big news.

Godfrey was head and long in his complaint over the case. He covered the news in a paper like the Detroit Times gave a bigger, thicker headline to a about place the reader who a get wing safety and a plus that it goes to a story of 495 persons involved, was remarkable story over *Lake Erie*.

On a bigger headline than it goes to the other *Kennedy* case. If accident were enough, you wouldn't have me complaining, but millions of people are not in case as you and they still associate every accident, even in some kind of accident, with dangers of all persons.

Finally, I disagree with your contention that everybody in Detroit was interested in the British students. Some of you editors are sure off in your approach of what the people want.

We have no sympathy for your head in these programs. We desire the British dangers must show, too. We have been trying to get editors to "reduce" their attention for two years, partly because of just such a new attitude as yours.

The *Lake Erie* event clearly told on the headlines was just a "national" reading to you. To me, it is as useful as all people dead, killed in relation, and how close to home because nearly everybody has an automobile, and it can happen to us all. The same disaster is irrelevant. But the *Kennedy* and 495 highway deaths were reported in the same edition of the Detroit Times, and both were considered too important that the girl on the wing. That makes me to me.

We can't get excited about the Godfrey incident.

But we do almost struggle in your saying that there is only one way to "play" news. You want know as well that it depends on the policy of the individual newspaper and the news also do the editing and headline writing. We realize that and all agree, but my guess, would have emphasized the wing story's crash as did the Detroit Times. If we did the Times type of editing we are following, whenever it may be.

If there was only one "right" way to play the news, we would not see stories as page one of the New York Times in *Headlines* that we don't even find anywhere in the *Trade News*, for example. Every paper has its own evaluation of news and news importance. To say there is only one right way, or that an outside source in its attitude toward the Detroit Times' policy that day, put attention credibility too far.

The most discouraging part of your letter, however, is your opinion that we are writing our facts even as disagreeing with our newspaper. When the editors of the newspapers of the country become so biased as to refuse to listen to anyone who contradicts the news judgments of even a minority of newspapers, then we have reached a very state indeed. Surely you don't think critics of the daily press are making their errors. Do you?

W. C. WOODMAN, JR., City Editor  
The News & Observer  
Raleigh, N. C.

Dear Mr. Woodman—Your letter will be enlightening to people in confusion who don't

understand newspaper life years ago more than you understand mine of ours. It simply doesn't make any sense to some of us when a paper like the Detroit Times gives a bigger, thicker headline to a about place the reader who a get wing safety and a plus that it goes to a story of 495 persons involved, was remarkable story over *Lake Erie*. On a bigger headline than it goes to the other *Kennedy* case. If accident were enough, you wouldn't have me complaining, but millions of people are not in case as you and they still associate every accident, even in some kind of accident, with dangers of all persons.

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Raleigh, N. C.

Dear Mr. Woodman—Your letter will be enlightening to people in confusion who don't

R. H. W.



**"Hands off" FLYING SAVES LIVES!**

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• For the Navy... Through the use of the Gyrocompass, the crew has full automatic stabilization in pitch, roll and yaw—the ultimate aim in the rotary wing field. Thus, military uses of the helicopter are almost boundless.

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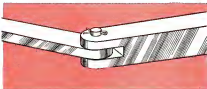


# How to replace hinge pins and cotter pins with

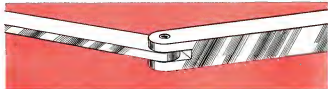
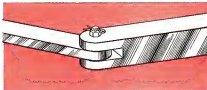
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**TRY THE ROLLPIN WAY INSTEAD . . .** Rollpins offer many advantages as pivot and clevis pins for linkages or yoke assemblies. Heat-treated to provide excellent fatigue resistance and wear characteristics, Rollpins fit flush, grip firmly in the outer or inner members, depending on your design requirements, and are simply, inexpensively pressed in place. They are faster to install than cotter pins or safety wire . . . straight edges protect workers' fingers and clothing. Rollpins are readily removed with a punch . . . can be used again and again . . . assure simplified maintenance.

**USE ROLLPINS (1)** To replace set screws and rivets. **(2)** To pin or key gears . . . pulleys . . . levers . . . knobs. **(3)** As locating dowels, stop pins or shafts for small gear trains.

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Please send me full application data and test samples of the Rollpin.

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Rollpins are easily pressed into production drilled holes—chamfered ends facilitate automatic or manual insertion.

Rollpins compress as they are driven—are self-retaining in production drilled holes—fit flush. Secondary hole-reaming or riveting operations are eliminated.

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